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ABSTRACT

Four papers address issues of identification, secondary program alternatives, guidance to develop creativity, and needed research in gifted education. In the first paper, "Some Creative Dimensions to the Issue of Identification," E. Torrance analyzes the problem of identifying and cultivating creative giftedness in an unfavorable national climate. He emphasizes the need to shift from standardized, stimulus-response tests, describes a successful program based on assessment of intellectual and creative potentials, and lists guidelines for measuring creative thinking and skills. A. Passow's paper, "Secondary Schools: Program Alternatives for the Gifted/Talented," outlines nine programs which provide alternatives for gifted/talented students. Program differentiated approaches are seen to include curricular changes, administrative organizational modifications, and community based experiential learning. In the third paper, "The Use of Developmental Stage Theory in Helping Gifted Children Become Creative," J. Gowan suggest the need to enhance creativity by encouraging right hemisphere brain function. J. Gallagher's paper, "Research Needs for Education of the Gifted" points out the need for studies on such topics as the definition of giftedness, design of programs for the culturally different gifted, and development of ways to stimulate or train creativity. (CL)

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Issues in Gifted Education

by
Dr. James J. Gallagher
Dr John Curtis Gowan
Dr. A. Harry Passow
Dr. E. Paul Torrance

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INTRODUCTION

"Issues in Gifted Education" was chosen as the title for this volume because it is a brief but accurate description of the volume's content. It is broad enough to encompass many areas of concern, yet it is sufficiently specific in scope. And it implies topics that are still open to debate.

The four papers subsumed under this title deal with the topics of identification, secondary program alternatives, guidance to develop creativity, and needed research. They were written to be presented by amplified telephone call to the Advanced Studies Institute on Gifted Education in Honolulu, Hawaii, July 9-13, 1979 (see appendix) and are printed here in the order of their presentation. They are intended not so much to provide answers as to ask questions, not so much to offer solutions as to highlight problems.

In the first paper, Dr. E. Paul Torrance states the number one problem in identifying the creatively gifted as follows: "How might we implement programs involving the identification and cultivation of creative giftedness in a national climate generally unfavorable to the full development of potentiality and to creativity?" He asserts that identification of the gifted and talented should be an ongoing, "dynamic, creative process," not a static one, and calls for a shift away from standardized, stimulus-response tests toward "a responsive environment approach in which intellectual and creative potentialities would be assessed in situations the child initiates." He describes one successful education program based on this philosophy and lists guidelines for other such programs. He then suggests methods for measuring creative thinking, creative motivations, and creative skills.

In the second paper, Dr. A. Harry Passow outlines nine specific secondary programs that exemplify alternatives for gifted/talented youth. These include both urban and rural programs, programs designed to develop a talent or gift in a particular area (for example,

art, music, math, science, or verbal creativity) and programs designed to encourage outstanding accomplishments in many areas. He then relates these specific programs to broader program categories and discusses the various approaches that can be taken in providing alternative educational experiences for the gifted and talented, including instructional variation in depth, breadth, tempo, or pace; curricular changes; administrative organizational modifications; cooperation between different institutional levels; independent study; and community-based experiential learning. Observes Dr. Passow, "By extending the learning environment into the community, the school enriches the resource base--both human and material--available to gifted/talented individuals. Frequently, such students are so advanced that school-based resources are limiting, rather than enriching."

In the third paper, Dr. John Curtis Gowan writes:

> Concern for the qualities of exceptional human beings arises out of an exceptional concern for the qualities of all human beings. Thus a developmental program for actualizing the talents of gifted children arises out of sound knowledge of developmental stage theory and the ability and motivation to apply it to the special problems of the gifted.

He describes how developmental stage theory can be used "in the struggle to transform gifted children into creative adults" and emphasizes the need for specialized guidance, distributed over a wider temporal span and over a wider personnel span, to aid this transformation.

Dr. Gowan points out that development, rather than being a smooth accretion like growth, takes place in discrete stages. He sees the gifted child's moving through these stages as being analogous to a ship's moving through a flight of locks: because the stages are discontinuous, guidance is often needed to help the child over the discontinuities so that he or she may escalate from one stage to another. Observes Dr. Gowan, "Most gifted children fail to make the jump from [Piagetian] formal operations to creativity and, hence, are lost to creative adult function." Dr. Gowan sees the need to nurture creativity by encouraging right-hemisphere brain function. He suggests ways to preserve

creative fantasy in young children, to use science to avoid the well-documented fourth-grade creativity drop, and to use regular writing assignments to stimulate verbal creativity in adolescents. Concludes Dr. Gowan:

> Giftedness is mere potentiality. A gifted child can be defined as one who has the potential for verbal creativity. A talented child can be defined as one who has the potential for nonverbal creativity. In each case, it is the actualization of the potentiality, not the potentiality itself, that is important. . . . For this reason, the name of the game is "How to Make the Gifted Child Creative."

In the fourth paper, Dr. James J. Gallagher underscores the importance of research in answering questions, validating programs, challenging old beliefs, bringing new understandings, and serving as a catalyst for change. He suggests that "the field of gifted education has experienced a kind of research drought in the past decade" because of lack of university involvement and lack of federal funding. He sees an urgent need for major research to

- define giftedness;
- develop appropriate programs for the culturally different gifted;
- design intervention programs for underachievers;
- devise environmental conditions and educational strategies to stimulate or train creativity;
- modify course content and develop auxiliary curricular materials for use with the gifted;
- understand "the logical and emotional linkages that cause so much of the American public to view gifted education with suspicion, if not downright hostility"; and
- develop community support systems for the gifted.

As Dr. Gallagher observes, "The field of gifted education has many unresolved issues that will be passed along to the next generation for more adequate resolution." The purpose of this volume and of the four papers it contains is to focus attention on these unresolved

issues and to stimulate new thought and creative discussion in these areas. If they help you discover giftedness, think creatively about creativity, or actualize your own or some other gifted or talented person's potential, then they will have served their purpose.

Sherri M. Butterfield
Editor

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I. SOME CREATIVE DIMENSIONS TO THE ISSUE OF IDENTIFICATION

by

Dr. E. Paul Torrance

Alumni Foundation Distinguished Professor
of Educational Psychology at the
University of Georgia, Athens

There are three rather obvious interpretations of the topic, "Some Creative Dimensions to the Issue of Identification." First, it could imply that the process of identifying the gifted and the talented itself has creative dimensions. Second, it suggests that there are a number of issues concerning the identification of creatively gifted children. Third, it implies that there are issues concerning the dimensions of creativity that should be considered in identifying the gifted and the talented.

I assume that the designers of the Advanced Institute on the Gifted and the Talented had in mind the third interpretation; however, the first two interpretations are so important and challenging that I cannot pass over them without comment. Thus, I shall comment briefly on the first two interpretations and then attempt to sketch a model that I believe is useful in identifying the creative dimensions of giftedness and dealing with the issues relevant to this process.

Identification as a Creative Process

For at least twenty years, I have believed that the identification of the gifted and the talented should be a creative process over time rather than a rigid, static determination of giftedness to stand for all time. However, I have not talked about this matter very much, as I

have rarely found anyone who would take the idea seriously. It is a very complex idea, and resistance to the identification of giftedness and talent in any form has been so great that further discussion of identification as a creative process has seemed futile. In many circles, it almost creates a riot to suggest that there might be other means than scores on intelligence and achievement tests to identify the gifted and the talented.

It would be very comforting to many people if we had a single measure of giftedness which could be applied at birth and would remain stable throughout life. Alfred Binet (1909), the pioneer of intelligence tests as we know them today, was much against this idea, as it applied to the mentally retarded. Even in his day, there were people who believed that the intelligence of a person is a fixed quantity that cannot be augmented. Binet, in his 1909 book Les Idées Modernes sur les Enfants, tried to demonstrate that this verdict has no value. However, throughout the history of American education, those who have presented research to support Binet's position have been widely ridiculed and derogated. If you do not believe this, examine the furore in the 1930s created by the research of the Iowa group (Skeels and Dye, 1938-39); in the 1960s by the studies of Rosenthal and Jacobson (1968); and in the late 1960s and 1970s by those who offered data in contradiction of conclusions of Arthur R. Jensen (1969, 1973). All who have challenged seriously this view have been discredited and/or ignored.

In some of my more optimistic moments, I have dared present the view that the identification of the gifted should be a dynamic, creative process. One such occasion occurred in 1979 when I had become emboldened by my work as chairperson of one of the forums of the White House Conference held that year. In my address to the Northeast Regional Conference for the Gifted and the Creative, I spoke on what I entitled "Broadening Concepts of Giftedness in the 70's" (Torrance, 1970). I reviewed the current multitalent concepts of giftedness, the hidden giftedness of the disadvantaged and the culturally different, the problems stemming from pressures for uniformity in programs for the gifted, some of the facts about the development of individuality during a child's early years, and the need for open-ended methods of

identification and programming for the gifted.

In discussing the problem of identification, I commented that I was not certain that tests would even be needed in the implementation of the concept of giftedness that I had presented. I argued that if we were to start almost from birth teaching children about their individuality and if the important adults in children's lives recognized and acknowledged their potentialities, there would be little need for tests. I pointed out, however, that standardized tests might still be useful in providing feedback for establishing realistic identities.

I also talked about the need in testing to shift from the stimulus-response approach with standardized tasks to a responsive environment approach in which intellectual and creative potentialities would be assessed in situations the child initiates. There would be an ongoing process in which parents, teachers, and talent developers would continually be recognizing and acknowledging children's potentialities. The process would begin very early in a child's life and continue at least through the years of formal schooling, if not through career development. I argued that this was necessary because the broadened concept of giftedness and creativeness is something dynamic and changing, not something static and predetermined. I then pled for attention to the ecological features of both schools and communities that figure prominently in the identification and development of giftedness and creativity.

This address, as expected, met with mixed reviews. Generally, however, what I had said was simply ignored. Later, I discovered that a few people had taken seriously what I had said and used it as a rationale for developing gifted/talented programs. The best example of such an implementation that I know about occurred in 1977-78 in the Montclair (New Jersey) Public Schools. The program had been carefully planned with widespread participation among teachers and parents throughout the system. Every child was regarded as potentially gifted and provided many opportunities for demonstrating giftedness. The implementation of this program required thoroughgoing changes in the organization of personnel and resources, the assignments of teachers and students, and the utilization of many school and community resources.

Every teacher in the gifted/talented schools taught exciting future-oriented courses he or she created. These courses included: foreign languages, such as Chinese, Russian, French, Hebrew, and Arabic; futuristics; data processing and introduction to computers; creative dramatics; film-making; leadership; science fiction; and many others. Enrollment in one of these courses was an opportunity to develop gifted behavior. For example, a child displaying unusual talent for learning Mandarin Chinese was provided continuing opportunities to develop this talent.

Superintendent Walter L. Marks commented upon the Montclair programs as follows (1978):

> The programs that we call gifted/talented in Montclair are programs that really should be offered, in my judgment, in every elementary school because they are divergent in their design. They are mind expanding. They teach us what we don't know, instead of what we know. They probe, they ask questions, they offer alternatives, they give choices, and they give more than equal educational opportunity to youngsters who need more than equal educational opportunity.

On the basis of my earlier thinking and the Montclair experience, I have suggested the following guidelines for programs in which the identification of the gifted and the talented is an ongoing creative process (Torrance, 1978):

1. Evaluate, identify, develop, and reward many different kinds of excellence--all of those kinds of giftedness and talent that our society needs and that members of our society need for health and self-fulfillment.
2. For a particular program (such as a magnet school), the criteria used in identification and evaluation should be those that are relevent to the purposes of the program.
3. Although emphasis may be placed upon the aptitudes relevant to the program under consideration, attention should also be given to personality characteristics, motivation, and creativity.
4. In programs designed to encourage excellence, one of the variables that should be consistently evaluated and encouraged is creativity.
5. In evaluating excellence and searching for giftedness and talents among racial and ethnic minorities, especially

disadvantaged groups, it is important to give attention to those kinds of giftedness or excellence that are encouraged and valued by the particular culture to which the person belongs.

6. Just as there are an almost infinite number of ways of attaining excellence, there are also an almost infinite number of ways in which a person can behave creatively.

7. Schools should be concerned about all of those kinds of giftedness and talent which, if given a chance, would result in excellence and which can be modified through educational experiences.

8. Evaluations of giftedness and excellence should not be limited to competitive activities. A major criterion should be usefulness to the society and to the individual.

9. In evaluating giftedness and excellence, freedom from imperfections should not be a criterion. Too frequently imperfections irrelevant to the evaluation prevent us from becoming aware of those gifted qualities that are highly relevant.

10. A fundamental quality in all evaluation of excellence is an aesthetic quality. The gifted person's behavior is "beautiful" and makes others aware of the beauty and excitement about them.

11. Another fundamental quality of excellence evaluation is to be found in perspective--the ability of the person, his ideas, his products--to make others see the world in a different and better perspective, to maintain its beauty, its excellence, under changing perspectives. Perhaps the evaluator, the identifier, must also assume different perspectives to even become aware of giftedness, talent, and excellence.

12. Still another fundamental quality underlying excellence and giftedness is that of constancy, endurance, predictability, and perseverance--always being there--always actively involved.

13. Yet another fundamental quality is emotional responsiveness--genuine caring, love, working for the good of others. It is a wellspring of energy and creativity that compensates for a variety of imperfections.

14. Above all, respect each child's individuality and aid him or her in achieving a strong, healthy sense of identity. Rather than honoring the cultural assumption that "the good child is a modest child," stress the fact that recognition and acceptance of positive characteristics are necessary for self-realization.

15. Teach children from an early age about their individuality. This would enable children to become aware of, accept, and develop their giftedness and talents and increase their chances of avoiding being misfits.

16. Make educational programs open-ended so that giftedness can emerge and be guided in healthy ways.

Problems in Identifying the Creatively Gifted

Perhaps the most difficult and fundamental problem involved in identifying the creatively gifted and in developing programs for such children is that of dealing with a national climate that is generally unfavorable to creative behavior. This is further complicated by a national climate that rather generally discourages the full development of potentialities. While I am convinced that today's schools give a better chance to creative talent than did the schools of twenty years ago, I am discouraged by this progress when I compare the national climate for creativity in the United States with that of a country such as Japan. This national climate is reflected in the address of Prime Minister Ohira before the Japanese Diet on January 25, 1979. In his introduction, the Prime Minister declared that the creativity of every individual should be welcomed and valued. Throughout the address, he challenged homes, schools, and communities to cultivate individuality, creativity, and an international sense. He emphasized the importance of the "long view"--developing a broader, richer, more accurate image of the future. He expressed the opinion that it was the responsibility of government to stimulate to the fullest the potentials of children.

In my comparative studies of the styles of learning of Japanese and United States high school and college students, attitudes concerning creativity and intelligence are in interesting contrast. Some of these differences revolve around the age-old fact that the Western world has placed greatest value upon logic, intelligence, and speed, whereas the Eastern world has valued more highly such things as intuition, creativity, imagination, and perseverance. These differences are highlighted by the following comparisons of responses to specific items:

1. Twice as many of the Japanese college students as their counterparts in the United States described themselves

as self-acting and creative rather than receptive.

2. More than twice as many of them preferred to solve problems intuitively rather than logically.
3. Twice as many of them preferred experiential ways of solving problems rather than logical ways.
4. Twice as many of them preferred synthesizing to analyzing.
5. More than twice as many of them enjoyed drawing and manipulating objects.
6. Less than half of them considered themselves more intellectual than creative.

The importance of identifying and developing creative talent has been argued by eminent historians such as Toynbee (1964), futurists (Polak, 1973), scientists (Seaborg, 1963), educators (Torrance, 1979), and others. Educators have long been aware that throughout history the common characteristic of all those who have made outstanding scientific breakthroughs, great artistic contributions, and social improvements has been their creativity. Today, however, there are additional reasons it is necessary to give a fair chance to creative children and adults, even elderly adults. We are living in an age of increasing rates of change, depleted natural resources that cannot be replenished, and global interdependence. We are moving into a post-industrial society characterized by increased heterogeneity, interdependence, interaction, and destandardization. All of these changes will require increased ingenuity and creative problem solving.

Therefore, I would state the number one issue in identifying the creatively gifted as follows: How might we implement programs involving the identification and cultivation of creative giftedness in a national climate generally unfavorable to the full development of potentiality and to creativity? Other issues might be stated as follows:

- How might homes, schools, communities, and societies generally create a more favorable climate for creative achievement?
- How might creative potentiality be given better opportunities to manifest itself?
- How might schools be reorganized to give better opportunities for creative potentialities to become fulfilled?

These are only a few of the issues that must somehow be dealt with in programs for the gifted and the talented.

Suggested Model for Identifying Creative Giftedness

Scientists studying creative behavior and trying to predict it (Crockenberg, 1972; Hoepfner, 1967; Wallach, 1976) generally have been unrealistic in their expectations of the predictability of tests of creative thinking ability. Although people tend to be motivated most to do things that they do best, the nature of creative thinking ability and the tenor of societal attitudes concerning it are such that there may, at times, be little or no relationship between creative abilities and the motivations and skills necessary for creative behavior or achievement. This relationship may be conceptualized from Figure 1-1, which depicts abilities, motivations, and skills as interacting variables. A high level of creative achievement can be expected only from those who have the motivations and skills to accompany the abilities.

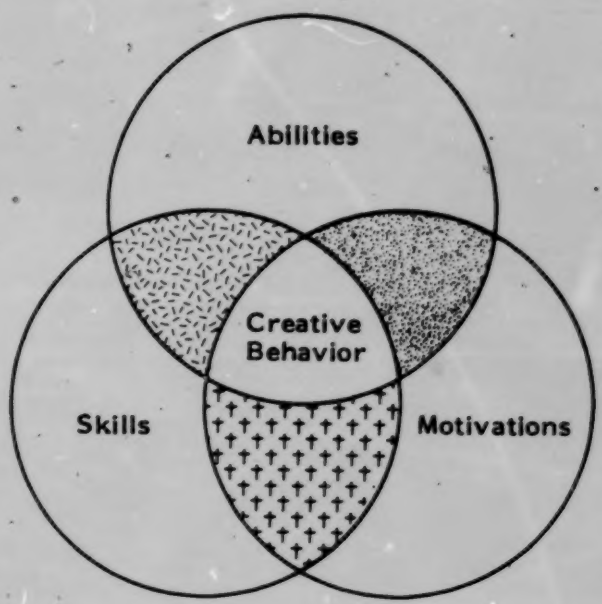

Figure 1-1. Model for Studying and Predicting Creative Behavior

A small validation of this model is found in a study reported by Torrance, Bruch, and Morse (1973). When I found that women in one of my long-range prediction studies (Torrance, 1972a, 1972b) were less predictable than men, Bruch, Morse, and I attempted to obtain responses to the Alpha Biographical Inventory (Taylor and Ellison, 1967, 1972). This instrument provides a creativity score that reflects creative motivations and skills obtained through practice and experience. We combined the creativity index derived from the test of creative thinking ability with the one obtained from the Alpha Biographical Inventory, and the canonical correlation rose from .43 to .60. Using the Alpha Biographical creativity score alone, the mean validity coefficient was .15 and the mean validity coefficient from the creative thinking ability tests was .38. The correlation between the Alpha Biographical creativity score and scores derived from the Torrance Test of Creative Thinking is only .15. Yet they combine to yield a coefficient of .60 to predict the real-life creative achievements of this sample of women tested twelve years earlier.

Many readers will recognize a resemblance between this model and the general models for identifying and/or defining giftedness proposed by Renzulli (1977) and Lamkins (1977). In fact, it is virtually a specific case of these models.

Many different kinds of data may be used in identifying creative giftedness in each of these three major dimensions: psychometric data, teacher ratings, peer ratings, self evaluations, interviews, auditions, creative products, and the like. However, I shall confine the remainder of this paper to a consideration of psychometric data in each of the three major dimensions: abilities, motivations, and skills.

Measuring Creative Abilities

Historical Perspective

Although psychologists have been experimenting with tests of creative abilities in the Western world for at least a hundred years, their widespread use as tools of science is quite recent. For example, we made an analysis in 1972 (Torrance and Torrance, 1973) of all of

the studies we could locate in which an effort was made to increase by deliberate methods the creative functioning of elementary and secondary school students. A total of 142 studies were located, and the earliest of them was published in 1961. The first battery of tests of creative thinking for use with school children was standardized and published in 1966, the Torrance Tests of Creative Thinking (TTCT).

As early as 1915, Guy M. Whipple had published his Manual of Mental and Physical Tests, which contained descriptions and limited technical information on several tests he labeled as tests of "imagination and invention." Whipple stated that the purpose of these tests was the measurement of capacity for creative or inventive thinking. He described an ink blot test which required the production of alternative perceptions or associations to the ink blots. A second test, termed "Linguistic Invention," called for the production of as many sentences as possible containing three nouns (e.g., citizen, horse, decree). Other test tasks in Whipple's manual called for the completion of sentences, the invention of stories, the development of a theme, the building of words, and the interpretation of fables. These tests were not standardized and were never widely used in research or in educational practice.

Somewhat later, Johnson O'Connor (1935, 1943, 1948), an industrial psychologist, developed and used some tests of creative ability in his Human Engineering Laboratories. These Human Engineering Laboratories were established in several large American cities; but they remained under Johnson O'Connor's control, and the tests were never published and made available for use by other psychologists and educators. In fact, about the only open source publication on the O'Connor tests is a somewhat popular book by Margaret E. Broadley (1943) entitled Square Pegs in Square Holes. The test O'Connor used was one of fluency of ideas, and the score was based on the number of ideas a person could write on a given subject within an allotted time. The subjects were absurd ones such as "How high is up?" The Human Engineering Laboratories apparently helped many young adults understand their creativity and make better use of it. Many of the laboratories' clients

presented histories indicating that their creativity was a liability in their careers at the time they came for help. Unfortunately, this work never came into the mainstream of psychology as a science.

Since 1950 (Guilford), a variety of tests of creativity have been invented. Many of them have been made available to scientists, and a few of them have been made available for use in education. J. P. Guilford (1956, 1967, 1971, 1977), using his Structure of Intellect Model, developed an enormous number of tests suitable for use with adults. It was not until 1971 that he published a battery of creativity tests suitable for use with children. His tests are still unsuitable for use with young children below the fourth grade.

In 1957, John Flanagan published his Ingenuity Test, which is regarded by some people as a creativity test and was a part of his nationwide Project Talent. This test is suitable for use with high school students and has a multiple-choice format. Since that time, Mednick and Mednick (1967) have published the Remote Associates Test for use with high school and college students. This test presents the test taker with three words and requires him or her to think of a fourth word that is related to each of the three words. For example, what word is related to base, snow, and dance? The answer is ball. We have baseballs and snowballs, and ball is another word for dance. These two tests (Ingenuity Test and Remote Associates Test) are rather deeply rooted in the middle-class, mainstream culture of the United States and rely rather heavily upon the specialized cerebral functions of the left hemisphere (Torrance and Mourad, 1979).

Development work on the Torrance Tests of Creative Thinking was initiated in 1958 (Torrance, 1962, 1966), but they were not published until 1966. By this time a variety of technical information had been accumulated, long-range validity studies had been initiated, and they had been made available for research among students and fellow scientists. Although this basic battery was developed in such a way as to be useful at all educational levels and to sample a wide variety of creative thinking abilities, I recognized from the onset that creative behavior requires more than creative thinking abilities. Motivation and skills are also essential. Thus, I would like to discuss the Torrance

Tests of Creative Thinking within the broader context of the model for identifying the creatively gifted.

Strategy of the Torrance Tests of Creative Thinking

From the outset, my strategy for developing tests of the creative abilities has been to develop a basic battery that can be used economically in a variety of practical and research settings at all educational levels from kindergarten through graduate and professional education and to supplement it with tests for different age groups, tests calling into play creative ways of thinking not tapped by the basic battery, and tests designed for special occupational groups. I shall discuss the basic battery in some depth and the other tests quite briefly.

The Basic Battery (TTCT)

The basic battery consists of alternative forms of a figural battery and a verbal one (Torrance, 1974). The figural batteries each consist of three test tasks or activities, each of which calls for different kinds of thinking. The verbal battery consists of seven different activities, each calling for a different kind of thinking. I have always maintained that creative thinking is not a univariate phenomenon. A person can be creative in a great variety of ways, and the problem is to assemble a battery that samples this universe as well as possible within the constraints of requirements in practical, educational, and work situations. This was accomplished (1) by analyzing the behavior of eminent creative people as recorded in autobiographies, and biographies, as well as experimental and descriptive studies of an empirical nature, and (2) by subjecting scores derived from a wide variety of test tasks to factor analyses and selecting tasks that are factorially different.

The major criteria for selecting specific tests and materials included the following:

1. They must be based on creativity theory.
2. They must be relevant to adult creative behavior.
3. They must sample different aspects of creative thinking.
4. They must be attractive alike to children, adolescents, and adults.

5. They must be open-ended so that persons can respond in terms of their experiences, whatever these may have been.
6. The stimulus materials, insofar as possible, must be universal enough so that they will be equally familiar or equally strange to all cultural groups.
7. The instructions and response demands must be adaptable to the educational range from kindergarten through graduate and professional education.
8. They must yield responses that can be scored reliably and meaningfully for such qualities as fluency, flexibility, originality, elaboration, unusual visual perception, synthesis, resistance to premature closure, and the like.
9. Testing materials, instructions for administration, time requirements, and scoring procedures must be such that the use of the basic batteries in most schools is feasible.

Rationale for the Verbal Activities

The Product Improvement Activity is a highly dependable test task and has relatively high predictive and face validity. It almost always makes sense to teachers, parents, and business people. They recognize that what they consider to be a desirable type of creative thinking is involved. It is also attractive from the standpoint of administration and scoring. It interests people of almost all ages. In the individual administration, it provides an object for manipulation. Even in group administration, the actual toy can be used to spark interest.

The rationale for the Ask and Guess Activity is obvious: it is an almost direct analog of definitions of the creative scientific thinking process. The Asking Activity gets at the ability to become sensitive to what is unknown or uncertain, to gaps in knowledge. Curiosity has long been accepted as an important aspect of scientific creativity and is recognized as being reflected in the number and kind of questions asked. The Guess Causes and Guess Consequences aspects of this activity simulate the formulation of causal and consequential hypotheses or forecasting ability.

Much creativity requires that we improvise with commonplace objects or materials. As the future confronts us more and more with the limitedness of natural resources, this ability will become increasingly important.

In the United States, we find that children and young people from poor families surpass children from wealthy families on this activity. They have had more practice in doing this kind of thinking. Responses may be evaluated for fluency, flexibility, originality, and a number of other qualities characteristic of creative thinking.

Rationale for the Figural Activities

All of the figural activities call into play abilities theoretically and statistically different from those engaged by the verbal activities. The stimulus materials are figural and bring into play visual imaging. The Figure Completion Activity calls into play the tendency toward structuring and integrating. The figures create tension in the beholder, who must control this tension long enough to make the mental leap necessary to produce responses that get away from the obvious. Failure to delay gratification usually results in premature closure of the incomplete figure and the production of an obvious, commonplace response. The invitation to make the picture "tell a story" motivates elaboration, the further filling of gaps, and articulateness in communicating a story. The instruction to create a title for the picture calls into play the ability to synthesize, symbolize, or abstract. The Circles, Squares, Lines, and Triangles activities bring into play the tendency to disrupt structure to create something new. The repetition of a single stimulus figure requires an ability to return to the same stimulus again and again and perceive it in a different way. While the instructions do not suggest that the repeated figures may be combined, they do not prohibit doing so. Thus, combining two or more of the triangles represents a freedom to see and use available alternatives.

In addition to the usual scoring categories of fluency, flexibility, originality, and elaboration, the figural activities may be scored for a number of other creative characteristics, including:

1. Abstractness of title
2. Resistance to quick closure of the incomplete figures
3. Expression of feelings and emotions
4. Articulateness in telling a story (showing relationships of the object to the environment)

5. Movement and action (running, dancing, flying, rising)
6. Combination of two or more figures, triangles
7. Expressiveness of titles
8. Unusual visual perspective (from below, above, at angle)
9. Internal visual perspective (from inside, cross section, etc.)
10. Extending/breaking boundaries, cutting holes
11. Richness of imagery (variety, vividness, strength, etc.)
12. Colorfulness of imagery (excitingness, earthiness, etc.)
13. Humor, conceptual or perceptual incongruities.

Validity of the Basic Battery

Hundreds of studies (Gibbs, Torrance, and Ball, 1977) have dealt with the content, construct, concurrent, and predictive validity of the basic battery. The real test of validity, however, is being able to show clear relationships between performance on the tests and real-life creative behavior at a later time. Long-range studies are best for this purpose. There have been several such studies, but one of the more convincing of these was one I initiated in 1959 with high school students and followed up seven years later and twelve years later. From this study, the following conclusions seem justified:

1. Young people identified as creative on the basis of the TTCT during high school years tend to become productive, creative adults.
2. At least twelve years after high school graduation appears to be a better time than seven years for a follow-up of creative adults. (The creativity predictors worked better after twelve years than after seven years.)
3. The unusual, creative occupations expressed as choices by highly creative high school students tend to become realities.
4. Highly creative high school students tend to develop careers that involve detours for relevant but unusual combinations of training and/or experience. A larger proportion of them included study and/or work in foreign countries as a part of their career development than did their less creative peers.

The follow-up of the young children (grades 1 through 6) tested in 1959 is now under way. Similar studies in Canada (Cropley, 1971), Australia (Howieson, 1979), and India (Majumdar, 1979) have produced similar results.

Other Torrance Tests of Creative Thinking

It is not possible within the limits of this paper to describe in detail the other Torrance Tests of Creative Thinking abilities. It is important, however, to call attention to two of them, Sounds and Images and Thinking Creatively with Action and Movement. Sounds and Images (Khatena and Torrance, 1973) is designed to assess abilities not tapped by the basic batteries. It makes use of auditory, nonverbal stimuli and calls for the production of original verbal imagery. The test taker is asked to produce imaginative and original images suggested by a series of four sound effects, ranging from a familiar and well-organized or coherent sound effect to one consisting of six rather strange and relatively unrelated sounds. The four-sound series is presented three times, and each time the subject is asked to stretch his imagination further. Several validity studies have been conducted and provide satisfactory evidence of validity (Khatena and Torrance, 1973). The most impressive of these have established significant relationships between scores on Sounds and Images and creative achievement in music, especially in musical composition (Holloway and Torrance, 1977).

Thinking Creatively in Action and Movement (Torrance and Gibbs, 1977) is an example of the tests that I have developed for use with children from age three through eight years. This battery of test tasks does not require verbal responses, although verbal responses are acceptable. As in the basic battery, the test tasks are open-ended and permit children to respond in terms of their experiences, whatever they may be. Poor children perform as well on this battery as their affluent peers. Test tasks require the child to think of many ways of moving from one point to another, many ways of getting a paper cup into a wastebasket, and many uses of paper cups. Another activity places the child in a variety of imaginary situations and asks him to act like the animal or person in each situation.

Measuring Creative Motivations

While creativity researchers have almost universally acknowledged the critical importance of motivation in creative achievement, the assessment of these motivations has been rather indirect and complex (Barron, 1969; MacKinnon, 1978; Welsh, 1959, 1975). I have thus far obtained the best results with two rather simple and brief instruments, the Creative Motivation Scale (Torrance, 1971a) and What Kind of Person Are You? (Torrance, 1971b; Khatena and Torrance, 1976). I shall describe them briefly.

Creative Motivation Scale

The Creative Motivation Scale (Torrance, 1971a) was first developed in 1958. Though it has not been widely used, the results of reliability and validity studies have been consistently favorable (Davis, Peterson, and Farley, 1973). This scale consists of thirty items that seem to describe the motivations of creative persons. For example, all of them were answered positively by a majority of the creative leaders at one of the annual meetings of the Creative Problem Solving Institute at Buffalo, New York, and the average creative leader answered 75 percent of them positively.

Perhaps you would like to try a sample of these items. All you have to do is answer "yes" if the statement describes your motivations and "no" if it does not.

1. I am apt to pass up something I want to do when others feel it isn't worth doing.
2. It is hard for me to work intently on a problem for more than one hour or two at a stretch.
3. My mind often gets so caught up in a new idea that I am almost unable to think of anything else.
4. I sometimes lose myself in experimenting with an idea that may have no practical value.
5. I have a feeling of excitement when an idea I am working on begins to form.

The correct responses to these items are: 1, no; 2, no; 3, yes; 4, yes; 5, yes. These items assess task commitment. To be truly

creative about something, one must have commitment, be genuinely concerned, be "in love with" something.

What Kind of Person Are You?

What Kind of Person Are You? (Khatena and Torrance, 1976) is also quite brief, and scores on it correlate about .70 with the Creative Motivation Scale. Of the two instruments, however, it is somewhat more thoroughly researched. It consists of fifty items of paired characteristics randomly arranged in a forced-choice format so that the items may call for a choice between two socially desirable characteristics or between two socially undesirable characteristics. Prior to the construction of these forced-choice pairs, I had a panel of expert judges rank sixty-six characteristics used to describe creative persons in order of their importance to the healthy, productive creative person. Items varying in rank were paired, and a person's score is the number of times the higher ranked characteristic was chosen.

Perhaps you would like to try a small sample of these items. All you have to do is select the characteristic of each pair which is closest to being a description of yourself:

Persistent versus Does work on time
Considerate of others versus Courageous in convictions
Becomes absorbed in tasks versus Courteous and polite
Attempts difficult tasks versus Desires to excel
A good guesser versus Remembers well

The correct answers are: "Persistent" over "Does work on time"; "Courageous in conviction" over "Considerate of others"; "Becomes absorbed in tasks" over "Courteous and polite"; "Attempts difficult tasks" over "Desires to excel"; and "A good guesser" over "Remembers well." What you probably experienced was a conflict in values. You found two characteristics that describe you, and yet you had to choose between them.

Measuring Creative Skills

Biographical Approaches

We may think of creative skills in either a specific sense (those involved in a particular creative activity, such as musical composition, sculpting, bionic invention, etc.) or a general sense. Perhaps the most successful of the instruments thus far invented for measuring creative skills in a general sense are various types of biographical inventories. The most widely used of these is Taylor and Ellison's (1967, 1972) Alpha Biographical Inventory, already mentioned. Like the Torrance Tests of Creative Thinking and Thinking Creatively in Action and Movement, it seems to be free of racial and socioeconomic bias. As early as 1954, I had published studies of a biographical inventory designed to measure high levels of excellence which was later revised for use in studying creative achievement. You might like to try a couple of items from this instrument.

How do you react to problems?

(1) Problems stimulate me.
(2) Problems upset me.

As a child, how frequently did you take a dare?

(1) Almost always
(2) Usually
(3) Sometimes and sometimes no
(4) Almost never
(5) Never

As you will surmise, these two items deal with skills involved in coping successfully with new problems and in risking, both widely recognized as characteristics of creative achievers.

A rather simple instrument consisting largely of items of an autobiographical nature and the achievement of creative skills is Khatena's Something About Myself (Khatena and Torrance, 1976). The following are examples of items from this fifty-item instrument:

I have planned or carried out experiments.

I have composed a dance, song, or musical piece.

I have invented a new product.

I can spot the source of a problem and define it.

I do not hesitate to be playful and childlike when I am trying to be productive.

Reliability and validity studies of this brief instrument have continued to be surprisingly good, but it has not been widely used in research or practice. Perhaps its best use will be in studies that make use of measures of creative abilities, motivations, and skills.

Your Style of Learning and Thinking

One way of looking at learning and thinking skills is through the perspective of recent research on the specialized cerebral functions of the right and left hemispheres of the brain. To study these skills, my students and I (Torrance, Reynolds, Ball, and Riegel, 1978) have developed alternative forms of an instrument that we have called Your Style of Learning and Thinking. Each item confronts the test taker with three choices: one involving a specialized function of the right cerebral hemisphere; another, a specialized function of the left hemisphere; and the third, the integrative functioning of both hemispheres.

While both right and left hemisphere functions are involved in creative achievements, validity studies thus far conducted (Torrance, Reynolds, Ball, and Riegel, 1978) indicate that creative performances are most highly correlated with test choices expressing a preference for the right hemisphere style of learning and thinking and are least correlated with those favoring the left hemisphere. For example, a variety of studies have shown statistically significant positive correlations between scores on the right hemisphere scale and measures derived from Something About Myself, What Kind of Person Are You, figural and verbal creative thinking ability as measured by the TTCT, Sounds and Images originality, Onomatopoeia and Images, Stein's Psychonomic Cue Test, Self-Directed Learning Readiness Scale, and success in applying learnings in the Georgia Governor's Honors Program to the back home environment.

Summary

Readers may add their own summary of this paper by responding to the questions or issues listed below. Your summary should not be

limited to the information contained in this paper. It should be supplemented by your own experiences, accumulated knowledge, and imagination.

1. What is meant by "creative dimensions to the issue of identification"?
2. Should the identification of the gifted and talented be a creative process over time or a static, one-time event?
3. Why is identification of the gifted and the talented as a creative process so strongly resisted?
4. What legitimate roles might testing play in an ideal program of identification as a creative process over time?
5. What guidelines might be developed to make identification as a creative process a practical reality?
6. Why is there such great reverence in Western cultures for intelligence and logic in contrast to Eastern cultures such as that of Japan?
7. Why is it important to societies to identify and give a fair chance to creative talent?
8. How might we implement programs involving the identification and cultivation of creative giftedness in a national climate generally unfavorable to the full development of potentiality and to creativity?
9. How might homes, schools, communities, and societies generally create a more favorable climate for creative achievement?
10. How might schools be reorganized to offer better opportunities for creative potentialities to become fulfilled?
11. In what ways have scientists trying to predict adult creative achievement been overly ambitious?
12. Why must motivation and skills, as well as abilities, be considered in understanding and predicting creative achievement?
13. What lessons might we learn from the past one hundred years of trying to identify creative potentiality through psychometric tests?
14. Why is there a need for tests of creative thinking abilities that can be used over a wide age range (kindergarten through graduate and professional school)?
15. What are the basic difficulties in developing such tests?
16. Is it reasonable to believe that creativity is a univariate phenomenon? Why or why not?

17. What evidence of the validity of creativity tests should be expected?

18. What are the major limitations of such evidence?

19. What are the most important creative abilities and how might these be more effectively identified and developed?

20. What are the most important creative motivations and how might these be assessed more effectively?

21. What are the most important creative skills and how might these be assessed and developed more effectively?

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2. SECONDARY SCHOOLS: PROGRAM ALTERNATIVES FOR THE GIFTED/TALENTED

by

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Program alternatives for gifted/talented students are many and varied. The literature is replete with descriptions of programs for secondary school gifted/talented youth which, while informative in many ways, rarely acknowledge a number of program aspects that surely affect the development of these students.

Secondary school programs use diverse definitions of the gifted/talented and employ diverse techniques and procedures for identifying such students. Curricular modifications and administrative arrangements take many forms. But, there are other aspects that influence the nature of secondary school programs for the gifted and talented. For example, the secondary school student has had an elementary school experience prior to his/her entering the junior or senior high school. What kind of program and what kinds of provision, if any, were made for the gifted/talented student in the elementary school? Were his/her gifts and special talents identified during the elementary school and were educational provisions made for developing this identified potential? In what ways, if any, are the junior and senior high school programs articulated with the elementary school experience? What kind of self-concept, attitudes, interests, and motivation have been nurtured in the elementary school? What concepts of education and schooling, of career and vocational development, of self and of social responsibility have

developed as a consequence of the pre-secondary school experience?

At the secondary school level, a number of considerations affect both the design of program alternatives for the gifted/talented and the ways students interact with these opportunities. Stated as questions, a few of these considerations are:

- What philosophy of secondary education and what purposes and functions of the junior and senior high school guide program development, as formally expressed and as actually implemented?
- To what extent is the high school seen as an institution providing a broad and basic liberal or general education and to what extent should it provide for specialized education? How does the school communicate its position with respect to manpower development? Is the school simply a preparatory program for some vocation or institution of higher education?
- What conception of the nature of giftedness and talent guides the school's planning of program alternatives? Do the school staff and the community believe that gifted/talented individuals require special educational adaptations and program modifications? How are such beliefs and commitments (or lack thereof) manifested and communicated? Which individual differences are recognized, accepted, and rewarded?
- What is the nature of the regular curricular offerings available in the school which can be adapted and modified to provide for more adequate and appropriate offerings for the gifted/talented students?

At the secondary level, the range of individual differences is much greater than at the elementary level as a consequence of the differential development experienced earlier. The preadolescent and adolescent years are periods of great turbulence because of the physical, mental, emotional, and social growth that take place during this period. The peer culture exercises considerable influence on the behavior of youth. For example, studies by Coleman and Tannenbaum describe the attitudes of adolescents toward academic brilliance and other kinds of giftedness.[1] The "adolescent society" effects the perceptions of youth toward more and less highly endowed peers and helps to decide which areas of "outstandingness" are given recognition and are rewarded. The youth culture has a profound effect on how gifted/talented students take advantage of the

educational opportunities the school provides for them.

Other determinants of program alternatives are such factors as the size of school, the nature of the student population, the nature of the staff, the location of the school with respect to the community, and the availability of human and material resources.

Some Illustrative Secondary School Programs

The illustrative secondary school programs for gifted/talented students described here exemplify diverse alternatives. For example, the Lewis County program in a rural, isolated region with several very small schools was designed for particular students in a particular setting with particular cultural and personnel resources. On the other hand, the Johns Hopkins Study of Mathematically Precocious Youth was designed for a very different student population.

The programs are described as if they were all still in operation--and some are, while others are not. They were chosen to illustrate program alternatives for gifted/talented students even though some of the sources from which the descriptions are taken are twenty years old. This was done for two reasons. First, the programmatic aspects represent good examples of such plans for the gifted/talented. Second, they represent part of the rich history of efforts to provide for the gifted/talented. Persons interested in designing program alternatives for gifted/talented students can learn much from such past efforts if aware of them.

Abington Senior High School

Abington Senior High School is located in a suburb of Philadelphia. Its program for the gifted is based on a comprehensive program in the elementary and junior high schools.[2] At the elementary school, (1) where possible, multiple sections are provided at each grade level to reduce the range in ability and achievement levels; (2) teachers provide subject matter enrichment for gifted pupils through individual projects and special work groups; and (3) gifted pupils from grades 5 and 6 may join after-school seminars in both the sciences and the humanities with experts and specialists from the community and nearby universities.

At the junior high school, special grouping, acceleration of content, and various kinds of enrichment are provided. Where the junior high school is too small, gifted students attend classes at one of the larger junior high schools at which special sections have been organized. Pupils study French in grades 7 and 8 and fulfill the equivalent of one year of that language. In mathematics and science, they are accelerated. Seminars in mathematics, science, and social studies are available in grade 9.

At the high school level, the program is not limited to provisions in the academic subjects of mathematics, science, social studies, English, and foreign languages. Electives that will permit gifted students "both to discover new interests and to develop in depth special talents and abilities" and subjects such as art, music, and public speaking are seen as adding "new dimensions to the academic program of the gifted student."[3] In addition to highly selective honors classes in various subject areas, students are grouped in mathematics and science classes on the basis of ability to make "it easier for the teacher to provide for individual differences in these content areas." Other elements of the Abington Senior High School program for the gifted include:

1. Honors Classes in English, foreign languages, mathematics, science, and social studies in grades 10 through 12. Course content for honors classes varies from that in regular classes in both depth and breadth of coverage. Honors classes aim at providing "more individual work, more opportunities for research, more creative work, more long-range projects, more individual conferences."[4]

2. The Co-Curricular Program includes a variety of activities, clubs, and special programs "designed to assist the gifted student in fostering his social development, broadening his interests, and developing his special talents."[5] Included in this program are a mathematics and science seminar and a social studies seminar, which meet weekly in the evening with experts from the community and nearby universities. Gifted students may also participate in school clubs and activity groups, which meet after school and in the evenings; in special elective academic courses, which meet for two or three periods a week; in leadership training workshops, which are held annually and include clinics and discussion groups; in a summer school, which enables gifted students to take advanced and elective courses; in individual and

group guidance programs; and in college and career conferences.

3. The Advanced Placement Program (APP), a program of the College Entrance Examination Board, provides college-level courses for the gifted for which college credit or advanced standing may be given by the college or university the student attends.

4. College Resources Program enables high school students to capitalize on nearby college resources, either through special programs designed and offered by nearby universities in which selected students take a course for credit during the regular day or through special courses offered at the college or university not available in the high school and not offered as part of the Advanced Placement Program.

5. Early Admissions Program enables the student to enter college before he/she graduates from high school. When the student has completed one year of college work, he/she is awarded a high school diploma. Related to this program is the Early Completion Program, which permits the student, by taking advanced work in summers, by taking college-level courses after school or during the summer, or by taking five or six major subjects during the regular academic year, to complete his/her high school requirements in less than three years.

6. The Student Exchange Program is not limited to gifted students but enables a student to spend a year abroad and receive academic credit for studies done in schools abroad.

The Abington Senior High School planners for the gifted have provided a variety of approaches "to fulfill more adequately the powerful potentials of its gifted students."[6] Moreover, the programs are seen as neither final nor complete but only guidelines that represent the best thinking of the educational staff at this point: "With additional time, experience, and creative, analytical thought the programs will grow."[7]

Evanston Township High School

Evanston Township High School is a large, four-year, comprehensive high school located in a large and well-established suburb just north of Chicago.[8] It offers a broad, multipurpose curriculum designed for

its pupil population, which has a wide variety of interests and abilities. There are college-level courses in the academic fields and special opportunities for students talented in one or more areas. Although the high school is separately administered, efforts are made to build on the program in the elementary and junior high schools.

The program for the gifted at Evanston Township High School includes:

1. Honors Classes in all of the school's academic departments. The few such courses offered at the ninth grade level are used to identify the talented. In grades 10 through 12, honors classes are set up in English, social studies, mathematics, science, French, and Spanish; but because there is never really a wide range of ability in chemistry, German, and Latin, no honors classes are offered in those subjects. Honors classes aim at providing for students who cannot be fully provided for within a regular class. Intellectually able students often are challenged by activities that may not be meaningful to other students.

2. Combined Studies is a four-year elective that "features pupil participation and planning within defined areas of content, guidance, and accompanying extraclass activities."[9] A wide range of subject matter is encompassed during a double period, and there is emphasis on individual reading and research. The opportunities in planning, discussing, and class management are seen as especially appropriate for the talented pupil. A special feature has been the concept of intellectual leadership with honors students expected "to make a significant contribution to creative individual and group progress."[10]

3. Advanced Placement Program courses are offered in a variety of subjects. Evanston Township was one of the APP pilot schools and has offered such courses in addition to the honors courses.

4. Special Interest Courses are available in a variety of areas such as:

> playing in the band or orchestra, singing in a chorus, individual voice or instrument lessons, or studying music as a listener; speech arts of some sort; arts and crafts, painting, designing; typing, shorthand, preparatory accounting, or other business education; shop courses such as mechanical drawing, metalwork, electricity, or auto mechanics; home economics classes; or a short driver training course.[11]

Normally, rather than requiring five academic courses for its able students, the program offers greater depth in academic areas.

5. Extracurricular Activities abound, and the very able are often the leaders in many areas. Some talented students add a leadership training course to their programs of four academic courses plus extracurricular responsibilities.

As viewed by the planners in Evanston Township High School, "the heart of the program lies in the quality of learning experiences expected of the talented" students.[12] In their view, "a better quality of learning involves not a mere collection of facts, but the development of abstract concepts and generalizations, the organization and integration of ideas, and a deep analysis of large and more complex phenomena."[13] The school gives attention to the nature of the staff members who teach the gifted, to the instructional resources needed to promote many kinds of interests and abilities, to the particular guidance needs of the talented, and to appropriate research and evaluation focusing on the programs for the talented.

The Portland (Oregon) High Schools

The Portland (Oregon) High Schools make it possible for students identified as advanced or talented to enroll in Educational Enrichment (EE) sections of subject courses or in advanced seminars.[14] Students are counseled on an individual basis according to ability and interest; and because of the demands of the seminars and EE classes, students are seldom enrolled in more than one of these sections. Special classes for the gifted include:

1. Special Sections--Educational Enrichment Classes in English, social studies, mathematics, and science. Regular courses of study are expanded and enriched, and more mature materials are used.
2. Seminars in Academic Subjects. Between five and eighteen students of high ability and achievement in a particular subject participate in a seminar based on that subject. The seminar method used is "a more or less logical system of trying to find out how an experience, book, or event might be interpreted, together with an awareness that interpretations are tentative and subject to modification in the light of new evidence."[15] Comprehensive Seminars

involve the rotation of selected students from teacher to teacher at several-week intervals to provide these students with an overview of four subject areas during one semester: English (or semantics), mathematics, social studies, and science. Time is also devoted to developing group discussion procedures, improving study habits, and building vocabulary. In the second semester, the student concentrates in the subject of major interest to him/her.

3. Special Talent Classes for students with exceptional talent. These classes include vocal and instrumental music, music theory and composition, art, creative writing, and dramatics.

4. Enrichment in Regular Classes. Because advanced students are enrolled in only one or two EE classes, many teachers of EE classes adapt the materials and methods found successful to enrich activities of gifted students in their regular classes.

In the view of the planners,

> Gifted students have the capacity for greater depth and insight into problems. It is assumed that gifted students are capable of acquiring more advanced knowledge more quickly that most students. Social skills for getting along with others in a complex society are necessary for all students, including the gifted. Vocational fields that these students enter will require more specific types of preparatory courses; therefore, students need information about the type of preparation necessary and the requirements of the various colleges that they may attend.[16]

Lewis County, New York

Lewis County, New York, is a rural area in which its small schools are as much as forty miles distant from one another.[17] Two or three of the most able students from each of its seven small high schools participate in the Lewis County Talented Youth Seminar, meeting in a remodeled storefront in the small village of Lyons Falls one afternoon a week. The seminar is a stimulating intellectual experience in which the group examines in depth a problem that has been formulated at the beginning of the year. The students "read extensively, take field trips, view drama, listen to music--all with one purpose in mind: the discovery of meanings in these experiences which throw light on the central problem."[18]

Rural gifted youth, because of their isolation and their relatively few numbers, pose particular problems for program planners. In planning the seminar, it was hoped that the program would, among other things,

> provide more adequate competition and stimulation; integrate knowledge; fill in gaps, if any, in skills and knowledge; reduce boredom; provide experience of a kind which pupils might find in college, i.e., research, intensive study, more rapid reading; and provide the opportunity to follow special interests.[19]

The seminar identifies a theme (for example, "Communication" and "Change in the Life of Man"), formulates some questions on which to focus, then draws on a variety of sources to extend insights and understandings. While originally conceived as a means of rounding out the experiences and filling in the gaps of twelfth graders, the experience indicated the need to develop projects for talented pupils in the elementary schools and to implement selected aspects of the seminar program within each of the high schools.

The seminar experience is related to the potentialities of the local school. For instance, seminar students are required to prepare a 20-to-50 page paper during the year; the English teachers are brought together to discuss ways of assisting the seminar students in each school. Also, teachers are invited to participate in training sessions where they explore the skills and understandings needed to exploit the potentialities of the talented students in the seminar.

The Study of Mathematically Precocious Youth

The Study of Mathematically Precocious Youth (SMPY) of Johns Hopkins University is aimed at identifying and nurturing seventh, eighth, and underage ninth graders who score extremely high on a test of mathematical reasoning ability, and providing them with educational opportunities that enable them to progress "faster and better with mathematics from Algebra I straight through the second year of college mathematics (usually Calculus III, linear algebra, and differential equations.)" [20]

The SMPY conducts an Annual Mathematics Talent Search in Maryland and the surrounding states using the SAT-M tests as its key means of selection, with other assessment techniques, such as the Sequential Tests of Educational Progress, to identify mathematically precocious junior high school students. Once students are identified, a "smorgasbord" of educational opportunities is laid out for them. Special fast-mathematics classes, often taught by university professors, are provided. Other means of acceleration in mathematics include telescoping of courses (two years in one), grade skipping, early part-time college study, credit by examinations, early college entrance, college graduation in less than four years, and bypassing the baccalaureate degree and going directly to graduate study.[21] Each student accepted for the project is aided in choosing, from the smorgasbord, opportunities that are appropriate for him/her.

Program for Verbally Gifted Youth

A Program for Verbally Gifted Youth, patterned after the SMPY, has just been initiated at Johns Hopkins.[22] Seventh grade students are selected on the basis of scoring at least as high as average high school seniors on the SAT and the Test of Standard Written English. Because the nonmathematical subjects do not follow sequences similar to those in mathematics, which topics are especially appropriate for the verbally gifted student is being studied as the program is implemented. In the first group, seventh graders completed a college-level German course in two months less than did college students. Those in the Writing Skills course did better than the average college freshman on the College Level Examination Program (CLEP) in English Composition. The program is operated on Saturdays. In choosing what courses to offer verbally gifted junior high school students, "it was decided to give them work that would be the basis for more complex studies."[23]

The Bronx High School of Science

The Bronx High School of Science is one of several high schools in New York City which specialize in some aspect of giftedness or talent.[24] Others include the High School of Music and Art, the High school of

Performing Arts, and Stuyvesant High School--each of which has a special purpose and focus. Formerly, other large cities, including Boston, Cincinnati, Detroit, and Philadelphia, operated schools for rapid learners. In some instances, special examinations were used to select students. At the High Schools of Music and Art and of Performing Arts, for instance, performance tests are used in the fields of fine arts, music, dramatics, and dance.

The curriculum at the Bronx High School of Science combines an integrated general education program with opportunities to pursue special interests in the sciences and mathematics. Students are required to take four years of English, four years of social studies, four years of science, three years of mathematics, three years of a foreign language, one year of mechanical drawing, a half-year of industrial arts related to laboratory techniques, and courses in health education, art, and music appreciation. The prescribed courses constitute 90 percent of the curriculum. The electives, constituting only 10 percent, include advanced science, advanced mathematics, advanced industrial arts, art, social studies (techniques in public discussion), creative writing, dramatics, journalism, world literature, and college English. The school is equipped with laboratories that provide facilities for various kinds of individual and group work and enable experimentation of an advanced nature.

Each year, 60 to 70 percent of the students enroll in college-type courses, mainly in the fields of English literature and composition, biology, chemistry, physics, and mathematics.[25] Student activities are an integral part of the program and provide opportunities for students "to excercise the skills, habits, and attitudes basic to active, intelligent citizenship" and to develop special interests and talents in areas beyond the confines of the regular curriculum.[26]

Some independent schools, such as the Roeper City and Country School (Bloomfield Hills, Michigan) and the Calasanctius School (Buffalo, New York), are especially designed for gifted/talented students, selecting the student population and adapting the curriculum to the special abilities and talents of those students.[27]

Advanced Placement Program

The Advanced Placement Program (APP) provides examinations in eighteen different subjects. In 1976, 75,651 students from 3,939 schools took 98,898 examinations and applied to 1,580 different colleges and universities. Three groups are served by the Advanced Placement Program: "students who wish to pursue college-level studies while still in secondary school, schools that desire to offer these students an opportunity to do so, and colleges that wish to encourage and recognize such achievement." [28] On the basis of examination results, the colleges may grant credit and/or appropriate placement to the student when enrolled.

International Baccalaureate

Related in a way to the APP is the International Baccalaureate, which is "an international program having a two-year structure of courses and an international set of exams" with the structure of the participant's curriculum prescribed as well as the "mastery of certain approaches in each of the courses to be examined." [29] A student in the International Baccalaureate program takes six subjects, including three at a higher level. These include:

> (1) language A (a student's own language); (2) language B (a second language); (3) a "Study of Man" (there are six options: history, geography, economics, philosophy, psychology, and social anthropology); (4) Experimental Science (five options: physics, chemistry, biology, physical science, science studies); (5) mathematics; (6) a sixth subject, either plastic arts, music, a classical language, a second language B, another option from 3 or 4, or additional mathematics. [30]

In addition, all students are required to take a course called "Theory of Knowledge." This course is examined locally and, although there are guidelines, each school works out its own procedures. Finally, each student spends one afternoon a week having some form of creative or aesthetic experience.

Program Alternatives for the Gifted and Talented

Gifted/talented students are quite diverse, particularly at the secondary school level. Some youngsters are slightly above average

while others are so unusual as to be extremely rare. Some youth are gifted/talented in just one area, while others seem to be unusual in almost every area. Some youth have outstanding ability but relatively little motivation and interest; others are both talented and highly motivated. Some gifted youngsters achieve at a level that causes schools to label them "underachievers." In short, gifted/talented youth are clearly not a homogeneous group. The range of differences among them is broad. Consequently, the program alternatives that must be provided must be broad as well.

In theory, there might be two approaches to program development for the gifted/talented. A staff might decide what kinds of program alternatives were to be made available and then identify and select those youngsters who might profit from such experiences. Or, it might assess the potential of individuals and then design educational opportunities for them. In a sense, the second approach would represent the Individualized Educational Program required by Public Law 94-142. The first approach appears to be the most widely used.

Gifted and talented students require differentiated educational programs and/or services, different from those regularly provided by the school. A program for the gifted/talented requires attention to a number of programmatic elements, including:

> the nature and needs of the gifted and talented students; philosophies of education and special goals and objectives; strategies and procedures for identification; curricular differentiation; appropriate instructional strategies; personnel resources, including teachers, mentors, and role models; material resources in school and community; administrative and organizational adaptations; ancillary services for socioemotional support; evaluation and assessment procedures; linkages with other agencies, including other schools, colleges, and nonschool establishments; legislation and judicial decisions.[31]

At the secondary level, provisions made for the gifted/talented are often in one or two specific areas rather than across the board in all academic or discipline areas. For instance, a student may be in a "college preparatory program" for most of his studies but in an honors class or advanced seminar in the humanities or in mathematics and

science. Instruction may be telescoped in one subject, or the student may take several Advanced Placement Program courses at a college level. Thus, the educational experiences for the gifted/talented may differ in breadth or depth; in tempo or pace, coming at an earlier development stage or in less time than is normal; or in kind, being of a different nature from the usual experiences.[32] Where qualitative differences in learning occur, it is "the interaction of the special characteristics of the gifted and talented student with the substance and the processes of the curriculum" that results in the learning differentials.[33]

Curricular changes that open alternatives for the gifted/talented may take various forms. Changes may be vertical, in which subject content may be moved so that students have contact with material at an earlier age or in less time than is normal. This is usually thought of as acceleration of content and may involve telescoping material, "skiping," moving courses, units, or curricular elements. Changes may be horizontal, providing for greater breadth and depth or intensity than is usual. Here the curricular emphasis might be on higher levels of abstraction, more advanced conceptualization, and greater creativity. Some adaptations may be described as reorganizational in the sense of restructuring of the curricular content of a particular discipline. Development of so-called spiral curricula around the structure of a discipline represents one approach to reorganization. And finally, curricular changes may be called augmentational in that experiences with disciplines not normally included in the curriculum are provided gifted/talented students. For example, oceanography, social psychology, musicology, anthropology, and archaeology are some disciplines not normally in secondary schools. Thus, curricula that make study of such disciplines available to the gifted/talented would provide augmentation or enlargement. Clearly, curricular modifications may involve more than one form of change, and the distinctions are not always clear with respect to particular alternatives offered the gifted/talented student. Some of these curricular adaptations are more appropriate for some disciplines than for others. Mathematics is a discipline that lends itself readily to horizontal changes or acceleration; history or drama may not respond to acceleration as much as to horizontal or reorganizational changes.

Finally, curricular differentiation, in whatever form it takes, should manifest a clear distinction between what is basic and what is advanced. What makes a college-level course in chemistry more advanced than a high school course in chemistry? Placement is not sufficient differentiation, of course. Clark Kerr has asserted that up to two-thirds of the last two years of high school and the first two years of college are repetitious.[34] There is nothing to guarantee that courses taught at college make greater demands on students or provide instruction at a higher standard. Advanced is a quality that involves levels of abstraction, higher levels of conceptualization, new or different resource use, problem redefinition, evaluation.

Program alternatives require attending to instructional and learning strategies appropriate to the curricular content and the special characteristics of the gifted/talented student. For some purposes, lectures may be satisfactory. However, more often seminar methods, independent study, and apprenticeship/mentor experiences are more useful in developing the potential of gifted/talented students. Involvement with technology, such as computers, may also be appropriate.

Special classes, honors classes, honors schools-within-schools, and special seminars are all administrative organizational modifications made in secondary schools for gifted/talented. Some school systems have designed "magnet schools" and "satellite schools" as centers that have the resources to provide for the special needs of gifted/talented students. Programs in such schools may focus on the humanities, the visual or performing arts, mathematics and sciences, technology, and so on. They are special schools or schools with special programs that provide for the specialized needs of gifted/talented students either separate from the regular high school or as a supplement to that school.

Cooperation between different institutional levels--that is, middle/junior high school and high school, or high school and college--represents still another approach to providing for gifted/talented students. For middle/junior high school students, there may be opportunities to enroll in high school courses for credit, use the laboratory and library facilities of the high school, become involved with high school student mentors, or have more advanced courses taught at the middle/junior high school

by high school teachers or gifted/talented students. Colleges and universities may offer courses in secondary schools for gifted/talented students (Syracuse University's Project Advance provides highly structured syllabi in English and psychology based on goal achievement, which are taught by high school teachers in a number of schools); or they may offer either regular or special courses on the college campus; or they may provide special programs for gifted/talented students (for example, Columbia University's School Science Seminar involves some 500 high school students in special university seminars); or they may make university professors available for instruction in high schools. While various programs have many of the same objectives of the Advanced Placement Program, gifted/talented students may not be interested in college credit and advanced standing alone but rather in the opportunity to engage in a more challenging, more exciting educational experience.

Independent study, in which individuals define and undertake a project enabling them to explore in depth and breadth some special problem or process, to develop deeper insights and understandings or extend their skills, and to exercise creativity and productive behavior, has long been used as a way of providing for gifted/talented students. Independent study may culminate in some product--term paper, research report, art object, for instance--or in some kind of performance. Independent study activities may be related to course or seminar work, or may be separate from such instruction. Gifted/talented students engaged in independent study may relate to a faculty member or a specialist from the community.

Another set of alternatives for gifted/talented students involves what is known as community-based experiential learning. The National Association of Secondary School Principals has given strong support to what it calls "action learning." Relating such activities to career education, the National Institute of Education uses the rubric "Experience-Based Career Education" to incorporate the provision of "learning experiences for students that match their individual interests with different adults in the community performing their daily activities." Moreover,

> these learning activities in the community may be part of a course in which the student is enrolled at school,

> they may be an overall program developed by the school staff, community participants, and the student, or they may be part of an independent study project of the student's own design. They may involve only a few days or last a whole year. In all cases, however, the school has to provide time and staff to match students with community participants and to keep things running smoothly.[35]

Experiential learning opportunities that are community based represent a form of learning by doing and the kind of mentor relationships from which the gifted and the talented can profit. Moreover, by extending the learning environment into the community, the school enriches the resource base--both human and material--available to gifted/talented individuals. Frequently, such students are so advanced that school-based resources are limiting, rather than enriching.

Some Questions and Issues to Be Resolved

The above discussion of secondary school program alternatives for the gifted/talented is, of course, necessarily incomplete. But the discussion and the descriptions raise a number of questions and pose issues that will need resolution. For example, consider the following:

1. Should there be concern for a "balanced program" for gifted/talented students? What constitutes a "balanced program" for such individuals? To what extent should secondary school experiences be aimed at a broad general education and to what extent should they nurture the development of specialized talents and abilities?
2. In what ways should the secondary school take into account the special characteristics of the pre-, early-, and adolescent students in the middle/junior high and senior high schools? Recognizing the impact of youth cultures and adolescent subcultures on talent development, what program adaptations need to be made?
3. What should be expected in the way of achievement of gifted/talented students? Should schools expect excellence or outstanding achievement in all areas or only in those areas where the student has unusual talents and abilities? Should the individual be expected to participate in "advanced" opportunities in all subjects or only in those in which he has an interest or has displayed unusual potential? How shall schools report "progress" for gifted/talented students?

4. What evaluation approaches should be used for gifted/talented students? Are they the same as for all other students? To what extent should the assessment focus on process and to what extent on product?

5. How should gifted/talented students be sensitized to their unusual responsibilities to society--if it is assumed that they do have such responsibilities? Should gifted/talented students be involved in moral education and values clarification experiences? Should gifted/talented students be encouraged to engage in activities that provide service to others even at the expense of developing their own specialized talents fully? Are such choices realistic and necessary?

6. Is the concept of "underachievement" an appropriate one for gifted/talented students who are achieving at the same level as average students? What constitutes "achievement" for gifted/talented students?

7. Should gifted/talented students be encouraged to accelerate their schooling in order to engage in advanced professional study as early as possible?

8. Should gifted/talented students be encouraged to engage in a broad-based schooling experience, or should they be encouraged to specialize as early as possible and to focus their efforts on their areas of talent and ability?

9. How should the "goodness" of a program for the gifted and talented be determined?

10. How shall we deal with the particular problems of gifted/talented persons from minority and disadvantaged groups? What special programming provisions need to be made? How are the talents and abilities of the minority and disadvantaged gifted better identified and better nurtured?

11. If community-based experiential learning is to be encouraged for gifted/talented students, how shall it be integrated with school-based learning?

12. How should teachers, mentors, and role models be selected for programs for gifted/talented persons?

13. To what extent should gifted/talented individuals be permitted to determine for themselves what program alternatives they should engage in or whether or not they should develop their special talents and abilities?

Other questions and issues can be readily raised on reflection of the program alternatives for gifted/talented individuals, but these are just a few that are frequently raised by those who would plan for the gifted/talented secondary school student.

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3. THE USE OF DEVELOPMENTAL STAGE THEORY IN HELPING GIFTED CHILDREN BECOME CREATIVE

by

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Before starting out on my assigned task, I must, in all candor, point out three issues where I feel that the LTI program (especially for advanced students) is seriously deficient. It is not my task to remedy this situation, but I think that honesty requires mention of these omissions. In my view this program, as shown to me in correspondence, is seriously deficient in:

1. attention to creativity as the objective of talent development;
2. attention to the dynamics of developmental processes and an understanding of developmental stage theory as an aid in providing adequately for the gifted child;
3. attention to the relationship between gifted child education and the other parts of humanistic psychology, namely, a broad humanism, intelligence, measurement, creativity, development, and parapsychology.

These, in my view, are the new thrusts in the area, and failure to pay attention to them will slow our progress and miseducate us so that we will be less able to deal with the challenges of the future. The central theme here is the exploration and development of the increasing powers and abilities of the human mind.

Note: This article contains author's material from the following copyrighted sources: Gowan (1960, 1972, 1974, 1978a, 1978b).

Second, the procedures by which such issues should be implemented include, in my view, three that I am not sure are being emphasized enough in the LTI program. They are, respectively, (1) the use of guidance, (2) the use of paraprofessionals, and (3) the use of hands-on research experimentation (as in Joe Renzulli's Type III enrichment). Again, I have neither the time nor the option to dwell on these matters.

I am also not happy about the maladroit phrasing of the subject assigned to me, which is "Psychoanalytic Perspectives on the Gifted/Talented." Being an iconoclast and not hung up on sex, I have little inclination to worship Freud, though I do recognize the basic nature of some of his developmental concepts. I believe that science rests on the progression of ideas, not cultism, and am therefore far more sympathetic to the views of Erickson, Kris, Maslow, Kubie, and Reich. The enunciation of affective developmental stages by Erickson in his famous "Eight Stages of Man" (Erickson, 1950) is, in my view, a landmark. Similarly, Maslow (1954) explored the positive side of mental health, particularly its higher reaches. Kris (1953) and Kubie (1958) have helped us understand the relationship of the cognitive ego to the "collective preconscious" from which creativity appears to come. And Reich (Mann, 1973) has extended psychoanalytic theory to larger issues of cosmic energy flow. I have entitled this paper, therefore, "The Use of Developmental Stage Theory in Helping Gifted Children Become Creative." In my view, this hits all the bases by using updated neo-psychoanalytic theory to undergird developmental processes, and then applies this new knowledge to the specifics of helping gifted children actualize their creative potential.

Accordingly, we shall proceed with General Developmental Stage Theory, Suitable Modifications for the Gifted Child, and Three Paramount Issues for Educators of the Gifted, namely: stage 3 (ages four through six), Creative Fantasy or Magic Nightmare; stage 4 (ages seven through eleven), Teaching to Avoid the Creativity Drop; and stage 5 (teen years), Establishing Verbal Creativity at Adolescence.

General Developmental Stage Theory

The Theory Summarized

The theme of The Development of the Creative Individual (Gowan, 1972) and of The Development of the Psychedelic Individual (Gowan, 1974) centered on our version of periodic developmental stage theory (see Table 3-1). The central issues of this theory in summary form are as follows:

1. Combination of the cognitive stages (Piaget) and the affective stages (Erikson) into unified form.
2. Extension of the five Piagetian stages to eight, the three new ones being creativity, psychedelia, and illumination.
3. Periodicity of three in the table, which results in similarities between stages 1, 4, 7, etc.
4. Reinforcement of the concept of discontinuity, succession emergence, differentiation, and integration as components of escalation.
5. Significance of "dysplasia" (malformation in development) as splitting of cognitive and affective stage levels in malfunctioning individuals.
6. Emphasis on self-actualization as the means of escalation into higher developmental stages.

In this paper, after detailing the significance of these six issues, we shall discuss developments that have taken place since publication of the books and that throw further light on the theory and update it, particularly in respect to higher developmental processes.

In The Development of the Creative Individual (1972), the writer stated the new hypotheses as a set of theorems:

1. Developmental process is best understood by conceptualization of the Erickson-Piaget-Gowan periodic table of developmental stages, consisting of triads, in which each developmental stage has a cognitive and affective characteristic (see Table 3-1). Using the earlier five-stage Piagetian model, the age-stage range for the two components, independently arrived at by Erickson and Piaget, is remarkably coincident.
2. Each stage has a special affinity for another stage three removed from it. Stages 1, 4, 7 are noticeable for a thing-oriented, sexually latent aspect, dealing with the

Table 3-1

The Erikson-Piaget-Gowan Periodic Developmental Stage Chart

ATTENTIONAL MODES ⇨ / ⇦ DEVELOPMENTAL LEVELS ⇨		LATENCY 3 it, they THE WORLD	IDENTITY 1 I, me THE EGO	CREATIVITY 2 thou THE OTHER
INFANT	ERIKSON (Affective) PIAGET (Cognitive)	TRUST vs. MISTRUST (1) SENSORIMOTOR vs. CHAOS	AUTONOMY vs. SHAME AND DOUBT (2) PREOPERATIONAL vs. AUTISM	INITIATIVE vs. GUILT (3) INTUITIVE vs. IMMOBILIAZATION
YOUTH	ERIKSON (Affective) PIAGET-GOWAN (Cognitive)	INDUSTRY vs. INFERIORITY (4) CONCRETE OPER'NS vs. NONCONSERVATION	IDENTITY vs. ROLE DIFFUSION (5) FORMAL OPERATIONS vs. DEMENTIA PRAECOX	INITIATIVE vs. ISOLATION (6) CREATIVITY vs. AUTHORITARIANISM
ADULT	ERIKSON (Affective) GOWAN (Cognitive)	GENERATIVITY vs. STAGNATION (7) PSYCHEDELIA vs. CONVENTIONALISM	EGO-INTEGRITY vs. DESPAIR (8) ILLUMINATION vs. SENILE DEPRESSION	

Source: J. C. Gowan, The Development of the Psychedelic Individual (Buffalo, N.Y.: The Creative Education Foundation, 1974). Copyright © J. C. Gowan, 1974.

world of experience. Stages 2, 5, 8 are ego-bound, ego-oriented, and ego-circumscribed. Stages 3 and 6 are times for love and creativity.

3. Within each stage, development occurs through cycles of escalation. Escalation is described as an aspect of developmental process which involves increased complexity and embraces five attributes: succession, discontinuity, emergence, differentiation, and integration. **Succession** implies a fixed order within a hierarchy of developmental stages. **Discontinuity** involves an ordered and discrete sequence of equilibriums like a series of stairs. **Emergency** involves budding and the making of the implicit, explicit in the flowering of characteristics unseen before. **Differentiation** refers to the attribute that clarifies, fixates, and metamorphoses the emphasis in successive developments. **Integration** summates the other attributes into a higher synthesis with greater complexity. As a result of this process, the environment may have maximum or minimum effect on the individual, depending on his position in the cycle. Continual environmental stimulation, however, is required for escalation into the higher (self-actualizing) levels.

4. There are three cognitive stages higher than those named by Piaget. They go with the intimacy, generativity, and ego-integrity periods, respectively, and are called: **creativity, psychedelia,** and **illumination.** These stages involve increasing mind expansion beyond formal operations (convergent thinking) and, hence, are increasingly rare, even in intelligent, healthy adults. Facilitation of escalation into them by various kinds of educational, therapeutic, sensitivity-training, meditational, and allied techniques is becoming a major movement for superior adults.

Although time and space are not available to offer proof of the validity of these hypotheses, some explanatory discussion may be useful to the reader. One immediate question is: Why should there be developmental stages at all; why cannot development, like growth, be one smooth accretion? The answer lies in the critical aspect of energy transformations in the individual. The transformation and focusing of energy is the essence of both the developmental and the creative process. Because the amount of energy available for use is not enough to be expended upon the three areas of "the world, the I, and the thou" simultaneously, it must be focused through attention and expended on first one and then another of these three aspects. This process of alternating focus is what leads to the three-phase periodicity of the developmental stages.

The Literature of Developmental Stage Theory

The earlier literature on developmental stage theory, particularly that of Piaget on cognitive stages and Erikson on affective stages, was thoroughly covered in our earlier efforts (Gowan, 1972, 1974), so that no further reference need be made to these pioneers. It is also appropriate to mention in this regard the developmental guidance of Blocher (1966); the developmental vocational choice stages of Ginsberg (1951), which correspond to our fourth, fifth, and sixth stages, respectively; the adolescent developmental tasks of Havighurst (1964); and the Maslow hierarchy (1954), all of which predated our efforts. We now turn our attention to other work corroborating these views but of later date.

First to be mentioned is the doctoral thesis of P. K. Arlin (1975), which predicted a developmental cognitive stage following formal operations. Indeed, Epstein, in the 1977 NSSE Yearbook, declares: "We therefore predict a hitherto unknown stage of intellectual development" (p. 344). Arlin called her stage "problem-finding," which is one of the chief discriptors of what we have called "creativity." It should be remembered in this regard that perhaps one of the reasons Piaget was unable to discover stages beyond formal operations was that he was testing his own three children; and when they reached adolescence, they would no longer submit to this daily drudgery.

J. Weinstein and Alfred Alschuler at the University of Massachusetts have reported on "Levels of Self-Knowledge," four of which bear uncanny resemblance to our stages 4, 5, 6, and 7 and are in roughly the same age bracket. They say, "What one does not do at a given stage that he can do at the next higher stage tells us an important story." In analyzing students' stories, they report as follows:

4. Concrete Operations: Stream of consciousness reporting of separate images with no causality, nothing but separate feelings, and no overall start and finish.
5. Formal Operations: Report of feelings with start and finish of story and a moral, causal outcome; however, no pattern across situations.
6. Creativity: Strong personal feelings in report of personality characteristics and personal style of which the story is an example, but outcome is fatalistic, working out the same across different situations.

7. Psychedelic: Choice, responsibility, and autonomy enter reports, with the individual able to change his response pattern.

While there are differences here, the developmental trend of these stages clearly follows periodic developmental stage theory.

Acceleration versus Escalation

A very complex question, on which the final answers are not yet in, concerns the issue of whether acceleration of (gifted) children in any stage can produce escalation into the next stage. The trouble is compounded by the fact that it is possible that gifted children may automatically escalate into a higher stage at an accelerated pace, or alternatively, that they may require special educational intervention to do so. Although acceleration is one of the few areas in gifted child education where the research is all positive (Gowan and Demos, 1964, pp. 182 ff), we should perhaps pause before we accelerate to ask what are we accelerating into. Perhaps an even better question is: Will acceleration produce escalation into the next higher stage? Unfortunately, the research here is not so clear-cut.

Webb (1974), in a study of "Concrete and Formal Operations in Very Bright Six- to Eleven-Year Olds," found that "no child showed any trace of [our stage 5] until he reached close to age eleven years." Brown (1973) showed similar results for stage 4 (and years). These results are reported by Epstein (1977, p. 347), who concludes that, while the rate of maturation in a new stage can be affected, there seems little evidence of accelerated escalation.

Keating (1976, p. 98), in an article, "A Piagetian Approach to Precocity," as a result of his own work, plus a review of Webb, Lovell, and DeVries, suggests a somewhat more complex interpretation in which "the brighter individual would be at an advantage in moving through the successive stages more quickly." He concludes: "Precocity across stages is clearly present, but perhaps not as pronounced as that within stages."

Defending the concept of "advance organizers" on school learning in accelerating escalation into high cognitive stages, Ausubel (1978, p. 256) says:

> Working with 6- and 10-year-old children Lawton (1977b) found an acceleration and facilitated effect from advance organizers on the learning of subject matter in that advance organizers significantly accelerated "a move from the level of pre-operations to that of concrete operations." In other cases it facilitated the more complete understanding of "concrete operations . . . at least within the context of a social studies unit" (Lawton & Wanska, 1977b).

Psychomotor, Moral, and Conative Components

There is no a priori reason the components of developmental stage theory should be restricted to cognitive and affective. Indeed, in line with Bloom's Taxonomy, one would expect a psychomoter component. This segment has now been found owing to the work of Simpson (1966) and Harrow (1972). The efforts of Kohlberg in the moral development area (Kohlberg and Mayer, 1972) are so well known as not to require further comment. Less known, but equally important, is the research of Perry (1968) in the conative area. An excellent compendium of these various components is found in the master's thesis of J. Simpson (1977, pp. 359 ff) in an article, "Developmental Process Theory as Applied to Mature Women." Of particular interest to developmental stage theorists is the synoptic table that accompanies this article. The correspondence of age ranges from these five different viewpoints is a validating aspect of the construct.

More recently, a Canadian psychologist, H. Koplowitz (Brain/Mind Bulletin, October 2, 1978), has proposed that the usual Piagetian cognitive stages are transcended by at least two higher ones: (1) a **systems** level, "in which the individual understands complementarity, homeostasis, and interdependence," and a **unitary operational thought**, in which the individual understands "that the way the universe is perceived is only one of many possible constructs." These two stages are again chief discriptors of the creative and psychedelic stages we had earlier enunciated.

Other hints of the possibility of higher cognitive stages may be found in the work of Gruber (1973) and Vygotsky (1974), on which Arlin and Epstein built.

Escalation

Developmental stages are characterized by escalation, which involves five separate but interrelated aspects known as succession, discontinuity, emergence, differentiation, and integration. Developmental dysplasia arises from a failure to escalate.

The objective of escalation is creativity, which is emergent in the personal "unfoldment" of the individual as part of his developmental process. This unfoldment is as natural as the budding and blossoming of a rose if proper conditions of sunshine, soil, and moisture are present. Once a certain developmental stage has been reached, creativity is a direct outcome of self-awareness.

The construct of escalation is helpful in understanding the process of development. "Escalate," a recently coined word, means to raise the level of action by discrete jumps; it derives from moving up an escalator, a flight of stairs, or a ladder. When one shifts gears in an automobile, one escalates; this is not just a matter of going faster--more properly, one engages a different service of power.

Succession. The term "succession" implies that there is a fixed order or hierarchy among developmental processes. The ordered hierarchy, in turn, implies a continual rise in the level of action at each stage. The order is invariant, although the time sequence is organismic and not strictly chronological.

The concept of succession implies that the track of development is fixed, in that a given stage follows and never precedes another. The rate of succession through stages and the extent of development at any stage, however, is flexible since these are influenced by the nature of the organism and its environment.

Discontinuity. The concept of discontinuity parallels that of succession. One cannot imagine a flight of locks in a canal as other than a succession of discontinuities, each with the water level at equilibrium. The order is invariant. One could not have the first lock, then the fifth, then the fourth, third, and second. As a flight of locks contains

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Note: This discussion of escalation is taken from Gowan (1974).

water at various stages of equilibrium whereas a waterfall does not, so this discontinuity of ordered sequences allows for equilibrium at various stages as a smooth growth curve does not.

Emergence. Emergence, or the debut of new powers, is the third aspect of escalation. As the child progresses from one stage to another in the developmental sequence, qualities that were implicit or covert in a previous stage become explicit or overt in the next or following stage. This bringing out or manifestation of emergent characteristics, some of them unexpected or unrecognized at the earlier level, is seen in many phases of development as the budding or preparation for the next phase.

Differentiation. Differentiation refers to the escalatory attribute that clarifies, "fixates," and modifies the emphasis in developmental processes. It resolves or fixates in the sense that "focusing in" on an object by a zoom camera lens clarifies the optical field.

Developmental processes that are loose and inchoate at early stages tend to become bound, defined, and fixated at higher stages. The increase in specialism and specificity results, in part, from the accumulation of habits and conditioned responses. Fixation is more complex, however, than mere conditioning: it involves selection of tempos, pacing, and the development of likes and dislikes of objects and processes. Experiences become organized into value systems which determine choice into similar patterns. A girl at the heterosexual stage of development will be attracted to boys in general; later she will love a particular boy. Fixation not only means that the attribute will be held more tightly, but that it will be apprehended in the same manner each time. The habituation of response tends to put an end to creative play variations on that response: we learn to do something well in a certain way, and it becomes more certain that we will do it in that way without variation. The process is analogous to "type casting" in the theater.

Integration. Integration, the final attribute of escalation, synthesizes the others. It is, in some respects, the mathematical integral of the previous aspects. A mathematical integral of an algebraic function is a related function of the next higher degree with the addition of a constant that must be determined by observation, thus giving two sources

of extra freedom and one of greater complexity. It is not surprising that a higher synthesis, greater complexity, and new degrees of freedom are characteristic properties of the concept of integration.

The tasks of a stage are not simple accretions of the previous stages, but are interconnected to form a meaningful unit (like the rafters of a roof) which unites into a gestalt called by Piaget "structures d'ensemble." This is more characteristic of our concept than his "integration," which simply refers to reemphasis. Following are some familiar examples of integration:

1. The child's interest in various parts of his body seen during stage two (autonomy) now becomes integrated in stage three (initiative) into a narcissistic love of his whole body. The energy of the parts becomes bound into energy for the whole.
2. In the transformation from child to adolescent, there is increase in complexity of emotion, and such emergent qualities as genital sexual drives, greater capacity for tenderness and feeling, and more intellectual range, all of which form a newer synthesis of previously identified aspects and permit new degrees of freedom and choice.

Integration also embraces a higher synthesis of already delineated elements; hence, it summates the concept of escalation. Who among us has not felt the thrill of driving a geared car on an open road and shifting into overdrive as the highway clears ahead? The car goes faster with less effort, because the gear ratio has been changed and the engine labors less per mile per hour traveled. We can do this and experience the consequent sense of freedom and elation at high speeds only on an excellent road. We feel this way even though there is no more potential power in the auto than there was at rest or backing up a steep grade. We are, in a sense, self-actualizing the automobile, for we are using it at its utmost at the task for which it was built. This top efficiency at any stage of development is reached only through a harmonious psychic-biologic relationship resulting from excellent mental health on the part of the individual which enables him to integrate his total potential or, as we say in current slang, to "put it all together."

Dysplasia (Mal-Development)

Dysplasia, a word borrowed from W. T. Sheldon, will here be used to show a split in developmental levels in which the affective level is ahead of the cognitive level. The concept involves developmental lag or arrest so that, in some part of his development, the individual is behind schedule. The effects of developmental dysplasia are that the individual tends to accept the achievements of any one stage as comprising the totality of self, and further potentialities of higher stages are not discerned or appreciated.

The most common adult dysplasia (the so-called 7-5 dysplasia) characterizes the average intellectual who is in the generativity (seventh stage) affectively, but still (since not creative) in the formal operations stage cognitively. Dysplasias are difficult to remediate, almost always on the cognitive side, and never of more than two levels. While further information on the area is available elsewhere (Gowan, 1974, pp. 166 ff), we may summarize here that a cognitive dysplasia prevents affective development from advancing more than two stages beyond the cognitive arrest. Hence, when arrest occurs in cognitive development, affective development is eventually blocked also.

We do not have space at hand to go fully into the guidance implications of dysplasias. Suffice it to say that they are the cause of most absences of creativity in gifted adults and, hence, are the targets of most counseling for the gifted. Prevention of dysplasias is also much more fruitful than their remediation.

Suitable Modifications for the Gifted Child

Concern for the qualities of exceptional human beings arises out of an exceptional concern for the qualities of all human beings. Thus a developmental program for actualizing the talents of gifted children arises out of sound knowledge of developmental stage theory and the ability and motivation to apply it to the special problems of the gifted. Because developmental stage theory is discontinuous (as befits the carrying over of the discontinuity found in physical science to behavioral

areas), guidance and help over these discontinuities is necessary. Not only will there be acceleration in the developmental stages for the gifted child (with consequent social dislocation), but the child, to become an actualized creative adult, must escalate to higher stage levels than Piagetian formal operations.

This brings us to two major departures in the guidance of gifted children: (1) guidance is distributed over a wider temporal span, starting earlier and extending later in the lifetime of the individual; and (2) guidance is distributed over a wider personnel span, embracing not just the ordinary guidance workers but literally all persons who come in contact with the exceptional child, from his parents onward. It should come as no great surprise to us to find that the guidance of gifted children follows the general guidelines that the remedy for their problems is to start as early as possible and involve them with as many types of guidance workers as possible, enlisting the home whenever feasible.

Developmental and differentiated guidance for the gifted has recently received some attention in a symposium issue of The Gifted Child Quarterly (Fall 1977) and in a new book specifically on the subject (Colangelo and Zaffram, 1979). There is a growing consciousness of the importance of guidance for the gifted. Just as it was once thought that the able needed no curriculum modifications, so it has been said that they are bright enough to find their way unaided by guidance services. What is conveniently forgotten is that the able may have special problems, which it takes individual guidance to handle. Some of these may be:

1. They may be faced with an embarrassment of riches in trying to make wise occupational and educational choices.
2. There may be problems attendant upon upward social mobility.
3. The may become aware of developmental tasks before they have the physical resources to perform them.

Note: Much of the discussion of guidance for the gifted is taken from Gowan (1960).

4. They may have more need than usual to develop the specialized interests that go with certain professional occupations.
5. There may be problems connected with the lack of adult model figures.

One of the problems many gifted youngsters face in connection with guidance has been expressed with some humor by a gifted student as the perennial question of "How far out beyond the safety railing can I lean without going over the cliff?" Gifted students are bright enough to know that they deviate in characteristics considerably from the norms and to see that, in consequence, many generalizations that apply to the average student do not apply to them. The problem for them is to discriminate between those situations that apply equally to all persons, regardless of ability, and those that apply to them only with diminished force. For example, the gifted student frequently finds that he can take one or two courses in excess of the requirements and that he does not need this or that prerequisite. It takes a wise counselor to help him discriminate between those experiences he can safely telescope and those that he should undertake in as full a measure as the next student.

The major function of the guidance person working with the able youth is twofold: first, to assist in personality development and the removal of emotional or environmental handicaps; and second, to aid and advise in the maximizing of achievement and college placement which will facilitate his progress to a professional career. Both of these matters are complex enough to require separate analysis and, hence, will not be developed here. It should be emphasized, however, that these tasks should be prosecuted with positive, aggressive action in place of the all-too-current passivity about able youth which infects many guidance offices. It is not enough to measure the function of the guidance office against the comparison of the mental health and scholastic achievement of these able youngsters with the norms; instead, we should strive to prepare these outstanding representatives for the really grueling task ahead of them. If our intellectual leaders are to keep pace and be found in the frequencies demanded by modern conditions, we need not only to deliver a much higher percentage of our able youth to the

door of the university but to ensure that they have the motivation and mental health to graduate. This means a program of college-going for able youth involving the encouragement, the motivation, the strengthening of curriculum, and the upbuilding of achievement on a level not approached by our high schools at present. It means a change of attitudes in students, teachers, parents, and the public regarding the importance of high school scholarship, the desirability of taking more than four "solids" per year, the need for new prestige symbols in adolescent groups, the decrease of community anti-intellectualism, the fostering of the conservation principle in young human talent--all matters of social values with which the guidance worker is concerned. While these issues are matters of community concern, they can be raised and fought for if professional educators are truly social leaders. A program for scholarship in the senior high school extending through the three years--not just the senior year--with prestige and other rewards for the participants and with good publicity regarding effective college placement and the various scholarships and awards that come to students is one way of starting such a program. Needless to say, such a job is a full-time task in the average high school and can scarcely be accomplished if the counselor is so burdened with the problems of the lower 10 percent that he has no time for the able.

Three Paramount Issues for Educators of the Gifted

Earlier we listed three paramount issues for teachers of the gifted, which indeed are, respectively, the principal educational tasks for stages 3, 4, and 5 (see Table 3-1). These tasks are, respectively, (1) creative fantasy or magic nightmare (initiative period, ages four through six), (2) teaching to avoid the creativity drop (industry period, ages seven through eleven), and (3) establishing verbal creativity (formal operations in the teens). Each of these tasks is directly concerned with the preservation and stimulation of creativity, and failure in any one of them at its appropriate level will probably result in a sterile and nonactualized gifted adult. While such failure is not

crucial for the average person, it is crucial for the gifted child, both as a source of anxiety and mental ill health in him personally, and as a waste of talent socially.

The key concept in all of these issues is the elicitation of right-hemisphere imagery, either through the indirect method of stilling the overriding left-hemisphere functions of (1) receiving incoming precepts and (2) internal discourse, or through the direct method of stimulating the right hemisphere while the left is operant. It has been known for some time that art, music, and spatial units of curriculum would tend to accomplish this, but it may be that newer and better curricular methods will allow other areas, such as science and perhaps mathematics, also to assume this function.

Right-hemisphere imagery is the vehicle through which incubation produces creativity. In his famous paradigm of creative process, Graham Wallas (1926) identified four components: preparation, incubation, illumination, verification. By incubation, he meant any technique of relaxation of the conscious cognition (left-hemisphere function), such as, but not confined to, dreams, daydreams, fantasy, hypnosis, meditation, diversion, play, etc., which allows subliminal processes (right-hemisphere functions) to operate. He saw preparation (academic discipline) as the necessary, and incubation (relaxation) as the sufficient condition for creative insights to emerge. Whereas most functions of the left hemisphere are concerned with convergent production as described by Guilford, functions of the right hemisphere are principally concerned with divergent production. These functions involve imagery through which incubation produces creativity.

A more practical question than "Where does imagery come from?" is "Under what conditions does imagery occur?" It is now quite obvious that, while imagery occurs spontaneously under hypnosis, and in trance, dreams, hypnogogic and hypnopompic states, as well as in other natural and induced altered states of consciousness, it can be found also in the more normal states, such as, daydreaming, fantasy, meditation, creative spells, relaxation, sensory deprivation, and the like, where the

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Note: This discussion of right-hemisphere imagery is taken from Gowan (1978a).

ego and full memorability are present. The key elements in the situation appear to be (1) lowering the sensory input and (2) stopping the internal verbal chatter; both of these point to allaying the overriding function of the left hemisphere. From the above it appears that right-hemisphere imagery goes on all the time and that it is merely necessary to pay attention to it. Learning how to do so is obviously a new educational challenge, if we are to educate both halves of the brain and, hence, to stimulate creativity in young people.

Creative Fantasy or Magic Nightmare (Ages Four Through Six)

Creativity is expressed in stage spurts, the genesis occurring in the third (initiative-intuitive) period when the child is drawn oedipally to the parent of the opposite sex. He may be plunged into a creative fantasy conceptualization of his world through which, with parental help and love, he gains some control over the new forces in his environment or, without parental help, he may experience a magic nightmare when the environment controls him, and he is powerless.

The creative fantasy is apparent in the third stage when an able and healthy child receives the full affectional approach of the opposite sexed parent. Hence, creative individuals tend to have oedipal and electral complexes. Boys who are affectionally close to their mothers and girls who are unusually close to their fathers during the years from four to seven tend to become more creative than others of similar ability. The child in this period responds to the warm affection of the opposite sexed parent by freely enlarging the bridge between his fantasy life and his real world. The affectionate adult who values the child's ideas stimulates and encourages the child to produce ideas and show off intellectually. The emotional support encourages the child to draw freely from past experiences, and to retrieve half-forgotten ideas from the preconscious. Thus he becomes able to dip further into this area and produce more creative ideas than another child whose efforts might be inhibited by his parent's disapproval or negative judgments.

Note: This discussion of Creative Fantasy or Magic Nightmare is taken from Gowan (1972).

The child's successes in winning the affection from the opposite sexed parent give some semblance of reality to the oedipal fantasies of this period. The bridge between fantasy and reality becomes strengthened while at the same time the child feels "in control," and he grows in the power to discriminate between what is and what is longed for. This control is perhaps what Kris meant by "regression in the service of the ego." This kind of creativity is exhibitionistic, with intrusive, phallic qualities characteristic of the stage. The fact that more boys are close to their mothers during this period (closer than girls are to their fathers) may help explain why there are more creative men than women in the world of adults.

At this time the child discovers his individuality in a world of powerful and forbidding adults. He recognizes his wants and impulses and senses the strength of his will, which can be satisfied either through action or fantasy. Each may lead to pleasure or pain, to joy or guilt, and to growing power and success or to helpless immobilization. For the child, this period can be a creative fantasy or a magic nightmare, on the one hand, a full expression of the Sullivanian "good me" and on the other, a frightening experience of the "not me," the resolution depending upon the degree of control he can exert as compared with the controls exerted upon him by the significant adults in his life.

Some of the best-loved and most enduring fairy tales throughout the world center around this theme of a child imprisoned in a magic kingdom, surrounded by powerful good and evil personifications, who later prove to be impotent. In Alice in Wonderland, Through the Looking Glass, and The Wizard of Oz, a powerful like-sexed figure (the Queen of Hearts, the Red Queen, and the Wicked Witch of the West) attempts to immobilize the child protagonist. After a series of scary adventures, aided by weak, male, nonhuman models (the White Rabbit, the White Knight, and Dorothy's three companions), the child triumphs over and reveals the actual impotence of the magical figure. Alice says: "You're nothing but a pack of cards," and herself becomes a queen in Looking Glass. After destroying the Wicked Witch of the West, Dorothy discovers that even the kindly Wizard of Oz is a fake and finally gets

back to Kansas on her own. The discovery that adults do not actually have the magic power ascribed to them by the child signals the transformation from the magic nightmare of the third stage where everything is in terms of badness-goodness to the workaday world of the industry stage where facts come into their own.

Teaching to Avoid the Creativity Drop (Ages Seven Through Eleven)

The drop in creativity in most children at about the fourth grade level is well documented by Torrance (1962) and others, although no reason other than a cultural one has been given. We suggest that this drop is caused by the extinction of right-hemisphere imagery as a result of the overteaching of the left-hemisphere functions of reading, writing, and arithmetic which occurs at the time, and the lack of stimulation of right-hemisphere functions caused by the lessening or absence of music and art from the curriculum and the lack of other right-hemisphere stimulation procedures. While The Gifted Child Quarterly for Spring 1979 is entirely devoted to a number of such procedures, including meditation and guided fantasy, we would like to concentrate here on elementary science as perhaps a more appropriate and easily used tool.

Let us accept the stipulation that the teaching of science to elementary school children will increase their vocabulary, experience, categorizing ability, and familiarity with the size, form, shape, and texture of matter--all aspects of Piagetian conservation in the concrete operations period. It may also motivate interest. All of the above are even more true of gifted children, but such results all involve a quantitative change. It is here suggested that, for gifted children at least, there may be qualitative escalation in line with developmental stage theory (Gowan, 1972) in the direction of formal operations and creativity. To put it more pungently, science may be used as a tool to preserve right-hemisphere imagery and to prevent the Torrance drop in creativity (1962) that occurs about age ten and is caused by the overteaching

of left-hemisphere activities such as the three R's to the extinction of right-hemisphere function.

To be sure, Suchman's "Inquiry Training" (1967) promised certain results closely approximating creative and divergent production, and other types of Socratic instruction (such as SMSG) have also, in past years, addressed this issue. What is new at present is a better understanding of developmental stage theory, coupled with a better understanding of the differential function of the cerebral hemispheres. Let us develop background on these matters.

Piaget's formal operations period as described in the literature is primarily Guilfordian convergent production, which, in turn, is primarily left-hemisphere function. Because it has been shown elsewhere (Gowan, 1978a) that right-hemisphere imagery is the vehicle through which incubation produces creativity, some very important implications immediately follow.

The first of these implications is that perhaps the formal operations stage as described is not what it should be with optimum symbiotic functioning of both hemispheres. We shall return to this thesis later. The second is that, if right-hemisphere imagery is so important, we ought to find out more about it and then learn to stimulate it educationally. Let us pursue this thesis further.

The seat of this imagery appears to be in the Wernicke area of the right cerebral hemisphere (Jaynes, 1976, p. 109). While it was once thought that special means were necessary to elicit it, it has lately appeared that the process (like the shining of the stars) goes on all the time, but, during our waking hours under most circumstances, is overlain by the more cognitive processes of the generally dominant left hemisphere. These involve the handling of incoming perceptual information and its processing into thought and action via language, and the continual stream of internal discourse that accompanies consciousness. Remove both of these activities from left-hemisphere function through relaxation, meditation, hypnosis, fantasy, daydreaming, sensory deprivation, or some similar state, and the imagery of the right-hemisphere is brought at once to focus.

But right-hemisphere activity need not be indirectly stimulated by removing left-hemisphere function in an altered state of consciousness: art and music teachers have long advocated that their efforts directly stimulated the creative imagery of the right-hemisphere (Williams, 1977). We now have bolder statements that science, if properly taught in an empirical, discovery-oriented manner, may also stimulate right-hemisphere imagery. Perhaps the most authoritative statement on the subject is by Professor E. S. Ferguson (1977), who says in part:

> Many features and qualities of the objects that a technologist thinks about cannot be reduced to unambiguous verbal descriptions. They are dealt with in his mind by a visual, non-verbal process. His mind's eye is a well developed organ that not only reviews the contents of his visual memory, but also forms such new or modified images as his thoughts require.

Better elementary science teaching can (in gifted children, at least) produce qualitative differences that accelerate the escalation of the Piagetian cognitive stages. If care is given to manipulation and discovery in the laboratory, such qualitatively different teaching can preserve right-hemisphere function with its incubative imagery, which results in creative production. Not only can the new teaching accelerate the stage changes, but it may actually be able to produce a more complete formal operations stage, where both sides of the brain engage in symbiotic operation.

Table 3-2 illustrates this point neatly. Usual teaching goes down the column in a manner stimulating left- (but not right-) hemisphere function. Thus, when it finishes in verbal analogies, the child is brainwashed into left-hemisphere formal operations. What should happen is a concomitant teaching to stimulate right-hemisphere operation, by going from the bottom up. It is, however, much harder for teachers to devise units of this type.

A second theme is that creative production is a more realistic objective in qualitatively different science teaching for the gifted than it is for average children, because in this case we are not merely teaching for consumer science knowledge but for preparation for creativity

Table 3-2

SOI Products in Concrete Operations Level Teaching

Direction	Hemisphere	Classroom Procedure (Unit)	SOI Product
Conventional Teaching (left-hemisphere oriented) ↓ / Needed Science Teaching (right-hemisphere oriented) ↑	Left	Vocabulary	Units
	Left	Categories, attribute finding, combinations	Classes
	Left	Verbal analogies	Relations
	Right	(General systems analysis)	Systems
	Right	(Invert, maxify, minify, reverse, change, etc.)	Transformations
	Right	(Remote associates, "What would happen if . . .?")	Implications

in later life. Paul Brandwein, in The Gifted Child as a Future Scientist (1955), was the first to appreciate this fact, and his little classic should still be required reading for science teachers. More recently Washton (1967) has indicated that creativity is a major objective in science teaching.

A third theme, much more recent in discovery, is that direct cognitive stimulation of the right hemisphere may be made in science, as well as in art and music, if spatial and empirical methods are adopted. Such stimulation results in the education of imagery, which is necessary for scientific creativity as well as for other types. Indeed, it may be useful to ask the question: How do major adult scientists create, as indicated by their own statements? One of the best sources of such information is a book called The Creative Process by Ghiselin (1952). Koestler (1964), in The Act of Creation, also investigated such statements. We lack the space to quote this impressive testimony, but it is to the effect that, even in science, it is imagery not logic that produces creative discovery. The great Einstein, himself, said:

> Words or language do not seem to play any role in my mechanisms of thought. The psychical entities which seem to serve as elements in thought are certain signs, and more or less clear images. [Ghiselin, 1952, p. 43]

Establishing Verbal Creativity in Adolescence

Because images are so much more understandable than verbal concepts, let us contrast the image of a sleepy peddler driving his shambling horse with that of a trotting jockey deftly spurring his thoroughbred to victory in a close race. It would be completely inappropriate for the peddler to whip his horse up to a faster pace; it would be entirely inappropriate for the jockey not to do so. In the latter case, the racehorse has the ability to reach running excellence, but needs the guidance and coaching of an expert driver to excel in a way in which only racing trotters can. As educators, we are involved in an exact analogy in attempting to spur gifted adolescents into verbal creativity that other, more average, children are unable to reach. The driver, in this instance, is a dedicated language arts teacher;

the race involves the competition of other gifted classmates in a segregated seminar; the spur and whip are the constant requirements for making daily entries in a journal and for writing more formal themes and papers.

Most gifted children fail to make the jump from formal operations to creativity and, hence, are lost to creative adult function. The toll is especially heavy among adolescent girls because of the combined sanctions imposed on creative expression by parents, teachers, and peers. We have devoted the entire attention of The Gifted Child Quarterly for Spring 1979 to this problem; the main constituents of the solution are (1) a dedicated teacher, (2) a segregated seminar, (3) maintenance guidance, and (4) continual pressure to produce creative writing via a journal.

In the struggle to transform gifted children into creative adults, these are the three times and places where the major defections occur. As educators, we can bring a much higher percentage of children through to adult creativity by more careful attention to these critical phases.

Conclusion

What ideas stand out in this presentation?

1. Giftedness is mere potentiality. A gifted child can be defined as one who has the potential for verbal creativity. A talented child can be defined as one who has the potential for nonverbal creativity. In each case, it is the actualization of the potentiality, not the potentiality itself, that is important. (We would never brag about a potentially good football player.) For this reason, the name of the game is "How to Make the Gifted Child Creative."
2. To make the gifted child creative, we must understand developmental stage theory with its blending of Piagetian (cognitive) and Eriksonian (affective) levels, and then apply these principles in guiding the development of the gifted child. This development demands that right-hemisphere functions not be lost so that some imagery may be preserved.

3. There are three developmental stage levels where the baby can be thrown out with the bath water. We have discussed them under the headings (1) creative fantasy or magic nightmare, (2) teaching to avoid the creativity drop, and (3) establishing verbal creativity.

4. The continued understimulation of the potential talents of gifted students is stupidity of the same order as running a car on the freeway in low gear or using a racehorse to pull a dump cart. It destroys the capability of the agent, and it wastes the resources of the environment. The memorable achievements of mankind consist in actualization of these potential talents, not in their denial.

Epilog

I dreamed I was walking through an enormous field of wild red roses. "How many roses are there here?" said a voice. "Oh, at least a million," I answered. "Are there any sports among them?" the voice queried. "Yes, here is one," said I, appropriately sighting one which had flecks of white on its petals. "And how many such sports do you think there are here?" asked the voice. "Oh, probably a thousand, if one assumes that once every thousand roses there is some mutant variation." "And could these mutants be developed into distinctive colors and patterns?" inquired the voice. "Of course, for that is the way our domestic varieties originate." I replied. "Ah," said the voice, "but you had to have a gardener who believed in the possibility of such development and then set about to accomplish it." "That is true," I agreed.

There are many more children than roses, and they are much more important. Do some of them have talents and potential in exotic abilities which we do not even understand, and so cannot begin to stimulate? The gardener has produced a domesticated rose much bigger and more beautiful than the wild variety; could we do the same with children? But who will be the gardener for humanity? What are the talents of man? Are we sure we know them all? What, if any, are the boundaries of his abilities? Or are they as evanescent as was the limit of the

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Note: The epilog is taken from Gowan (1978b).

four-minute mile? What might we accomplish if we truly educated our children for the maximation of all talents they possess?

A century ago, lightning-fast calculators were exhibited as side-show freaks. Since my dream, I am haunted by the nagging possibility that some children possess similar exotic talents, which, because they are not appreciated by society, are not cultivated or stimulated, and we are therefore back looking at the wild rose mutation, rather than visualizing what it might become with husbandry. What are some of the possible powers of mankind?

Could empathy, for example, extend to telepathy? Could spatial visualization extend to nonspatial visualization? Could intellectual accretion and learning become telescoped into instantaneous knowledge and understanding? Some otherwise saintly and truthful mystics have told us that they could. And it might not be amiss to check out this possibility.

Hunt and Draper (1977, p. 20) tell us of the powers of the electrical wizard Nicola Tesla:

> He was conscious of certain phenomena before his eyes which others could not see. He envisioned objects and hypotheses with such reality and clarity that he was uncertain whether they did nor did not exist.

Before we regard Tesla's powers as miraculous or his biographers as liars, let us remember that, when a picture of the scene is chromokeyed behind a newscaster as he describes a news event, we do not react in disbelief, nor do we when we see a virtual image in a holographic display. Science has sanctified these miracles, so we believe them though most of us cannot explain their technology. If geniuses like Tesla are forerunners, then it might be useful to recognize the possibility of such unusual talents and to begin to study how to develop them in others.

In conclusion, let me go back to the speech of Huxley's minister of education (1963, p. 208) on the child and his potentialities:

> How does he do his thinking, perceiving and remembering? Is he a visualizer or a non-visualizer? Does his mind work with images or with words, with both at once, or

> with neither? How close to the surface is his story-telling faculty? Does he see the world as Wordsworth and Traherne saw it when they were children? And if so, what can be done to prevent the glory and the freshness from fading into the light of common day? Or in more general terms, how can we educate children on the conceptual level without killing their capacity for intense non-verbal experience? How can we reconcile analysis with vision?

Here are the problems of education consequent upon the differential functions of the right and left hemisphere posed clearly a decade before psychology discovered the difference. As Dr. Parnes has clearly told us, problem finding is the necessary precursor of problem solving. Today we have found that El Dorado exists; we also have a map for getting there; we have less than a quarter of a century left to make the immense journey.

Questions

1. Refer to Gowan's criticism of the LTI program (page 47). Do you feel this criticism is valid or is it exaggerated? Take one side or the other and defend it with reasons and citations.

2. Gowan is nearly alone in placing developmental stage theory (page 49) as anterior to and necessary for an understanding of the psychology of gifted children. Do you agree with him? Why or why not?

3. Developmental stage theory contains a basic premise that, while the assimilative aspect of growth may be continuous, the accommodation aspect of development is not. How do you feel about this premise? In your relationships with gifted children, have you seen examples of developmental discontinuities?

4. Look at Table 3-1 (page 50). Does developmental stage theory have the importance attached to it? What are the strengths and weaknesses of the three-by-three table?

5. Do you think the concept of developmental dysplasia is a viable one? Can you give an example of how this concept could help you in dealing with a student?

6. Gowan's approach in the paper betrays the fact that he comes from a guidance background. How would the paper have been different if written by a person from a curricular or administrative background?

7. This paper makes a strong pitch (page 62) for the elicitation of right-hemisphere imagery as a key in the development of creativity. What do you think of this new concept? Does it help you to understand why creativity and intelligence are not highly correlated in the gifted?

8. What do you think about Gowan's explanation of the Torrance drop in creativity at age nine or ten? Have you an alternative explanation?

9. According to the theme of Gowan's paper, which would be the correct procedure in an educational experiment:

(a) select on both intelligence and creativity and then subject the experimental group to special treatment, or

(b) select on intelligence alone and then hope that the special treatment will develop creativity in the experimental group?

Give reasons for your answer.

10. Explain the significance of Table 3-2 (page 68) and devise some procedures in an elementary subject that would accomplish right-hemisphere stimulation according to it.

11. What do you think about the suggestions for developing verbal creativity in adolescence (page 69)? Are there some other alternatives? Have you read the incubation issue of the Gifted Child quarterly (Spring 1979) for some of them?

12. Gowan's paper has a psychedelic (mind-expansion) aspect to it. He appears to see unlimited horizons for the development of human potential. Do you feel that this optimistic view has value? Do you agree with it, or do you prefer the more prosaic views of others?

13. In choosing to accent the positive potential, Gowan has neglected a psychoanalytic look into the distortion of neurosis in the creative process, and the alienation, stemming from both personal and cultural sources, that the gifted child feels. Would such an analysis have added dimension to the paper? Would it have been helpful? Why, do you suppose, did Gowan omit it?

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4. RESEARCH NEEDS FOR EDUCATION OF THE GIFTED

by

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The purpose of this paper is to outline some major research needs related to the education of gifted children. When research needs are discussed in a given area, we generally try to think of unanswered questions that puzzle us, or educational program elements that we would like to have tested for their validity. However, there is another use of research that should not be overlooked. Research gives an attitude or tone of thoughtfulness and review to a given subject area. It has the effect of challenging old beliefs and bringing new understandings and new opportunities to the practitioner. In this way, it operates as a catalyst for change.

One has only to think of a world in which there are no investigations and no research to fully understand how thoroughly that world would be under the control of senior practitioners. The way to obtain wisdom in such a world would be to wait for the senior people to pass it along. From generation to generation, procedures and practices would be handed down unevaluated, without much discussion of new directions or new tacks.

It is not too much to suggest that the field of gifted education has experienced a kind of research drought in the past decade. There are a number of reasons for this lack of major research. While a few investigators from various universities have played some role in the

field, universities, as organizations, have not. If we wish to stimulate major research interest, we must find ways to bring the universities, who are the primary source of research interest, back into this content field.

A second reason for the research drought is that few, if any, funds are earmarked for gifted research. The tendency is for the federal government--the prime source of research money--to take a directive role, that is, to decide what research should be done and upon whom. The result is contract research, where the specifications of the research are set forth in advance and the researcher has no option except to bid or not bid on the study to be done. Such contract research often forces attention upon special groups in which the government has a current interest (that is, the culturally different or the handicapped) and ignores the gifted (Gallagher, 1979).

One has only to look at two major examples to see how research, in fact, changes the whole pattern of educational philosophy and delivery. The work of Getzels and Jackson (1962) and of Torrance (1969) in the area of creativity has provided the base for, and the focus on, educational objectives for the past fifteen years. They, in turn, got their direction from Guilford's structure of intellect (Guilford, 1950). Without the theoretical conceptualizations of Guilford and Bloom (1956), we would have a difficult time even conversing about productive thinking or giftedness. The work of these educators in creativity and productive thinking in the late fifties and early sixties has played a major role in guiding the development of what is now known as the differential program, or curriculum, for gifted students.

Terman's longitudinal studies (1954) not only stimulated thinking about gifted children, but actually tended to define the area itself. Without his work, which defined intellectual "giftedness," there is some question as to whether there would be a field of gifted children today. It is because we are beginning to understand the important role that the presence of research plays that we feel doubly concerned about the current lack of major investigations.

Research Areas to Investigate

Definition

One of the most substantial contributions researchers in the 1980s could make to gifted education would be to further delineate the definition itself. Since the early 1970s, a broad, general definition has been introduced to replace the earlier definition based mainly on IQ scores. This definition, as it appears in federal legislation, is as follows:

> Gifted and talented children are those identified by professionally qualified persons [and] who by virtue of outstanding abilities are capable of high performance. These are children who require differentiated educational programs and services beyond those normally provided by the regular school program in order to realize their contribution to self and society.
>
> Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas: (a) general intellectual ability, (b) specific academic aptitude, (c) creative or productive thinking, (d) leadership ability, (e) visual and performing arts, (f) psychomotor ability. [Marland, 1972]

However, stating a definition is one thing and making it operational in some practical educational sense is quite another. What each of these six dimensions needs is, first of all

1. A clear statement of what constitutes "giftedness" in this particular area.
2. The development or specification of procedures or instruments by which the appropriate identification of gifted individuals can be made.

For example, what is "leadership ability"? Is it the same whether we think of the captain of the football team or the leader of the debate team or a leader of a student protest movement? What are the instruments or procedures for identifying actual or potential leadership? Is it possible to train gifted leaders with appropriate instructional procedures or experiences?

The notion of "trainability" is, in itself, a revolutionary concept of giftedness. In the early part of the twentieth century, there was a strong assumption that mental performance was based almost entirely

upon native ability, which was passed from one generation to another through a complex, hereditary, polygenic process. It was upon these assumptions that the earlier intelligence tests were developed and interpreted (Gallagher, 1975).

Acceptance of the concept of the purely genetic nature of intelligence led to some embarrassing and troubling results, such as consistent racial and ethnic differences in the proportion of children identified as gifted (Adler, 1963). It is now clear that genetic characteristics interact in some complex way with environmental factors to produce the results we see in gifted individuals. We need to do a great deal more sophisticated research to understand the nature of these characteristics and factors and their interactions.

Intellectual Giftedness

We have progressed considerably from the time we defined "intelligence" as "those characteristics that IQ tests measure." But what is the nature of high level intelligence and what role does the environment play in bringing it to fruition? The environment includes those various interlocking envelopes, such as family, peer group, and culture, in which the developing child must operate. We accept the family and interactions within that family unit as being critical to the formative development of the child. The subculture in which the youngster exists also shapes the child through its own priorities and values. There are many complex interactions between developing ability and environmental presses. While these have been rather extensively explored with children who have learning problems, they have been more or less ignored in gifted education.

Culture

One of the myths that we have been living with since the culturally disadvantaged gifted were called to our attention is the assumption that, even under unfavorable environmental conditions, giftedness can maintain itself much as a lantern continues to shine even though a basket is placed over it. Given this assumption, our task was mainly to find some device to "lift up the basket" and let the light shine forth.

This myth is, of course, based on the earlier concept of intelligence as being entirely genetically determined and not, therefore, shaped by cultural experiences.

In practice we recognize that this view of the world of the culturally different gifted child is incorrect. The weight of the current evidence suggests that the environment can be destructive to the full use of intellectual abilities. An environment that has little use for high level thought processes can reduce substantially, or even eliminate, for all practical purposes, the high talent and ability that might have been present originally. The notion that superior talent can, in fact, be suppressed or destroyed should lend additional urgency to our attempts to provide stimulating and exciting educational experiences for the culturally different gifted.

Unfortunately, much of the very limited research that has been conducted in this area has focused on a rather sterile attempt to identify the culturally different gifted, with little attention being paid to what exciting educational stimulation can be provided once they have been identified. We lack the conceptualization of what is to be done.

Gallagher and Kinney (1974) reported on a conference oriented to the culturally different gifted in which there was major participation of persons from a variety of culturally different backgrounds. Four major recommendations emerged from the conference:

1. Stress cultural pluralism in the curriculum.
2. Make use of community resources to supplement the school program.
3. Recruit and train personnel who understand cultural pluralism and who may be members of the culturally different group themselves.
4. Impress on public decision makers at the state and federal levels that resources are needed to produce model programs and demonstrations that illustrate good practices with culturally different groups.

It is clear that we have no organized strategy to deal with the diversity of needs and interests. As one thinks of the American Indian in the desert, the inner-city Puerto Ricans in New York, blacks living in poverty in the rural South, and the Chicanos in southern California,

one realizes the foolishness of trying to design one alternative program to meet the needs of all of the talent and gifted members of each of these special groups. One of the major challenges of our day, therefore, is to determine a strategy for effective programming in these varied situations.

The Underachiever

One of the topics that has been of substantial interest in gifted education but has gradually been put aside is gifted underachievers, those youngsters who show major gaps between potential and performance. The existing literature has made clear a syndrome of personality characteristics that comprise the portrait of the chronic underachiever. This pattern includes a lack of self-confidence, the inability to persevere, a lack of a sense of purpose or drive, the presence of feelings of inferiority, and the usual presence of family conflict. Whether the family conflict is a cause or a result of the underachievement remains an open question (O'Shea, 1970).

The most significant area of missing investigations, however, involves the attempts to design and evaluate intervention programs that would substantially modify the pattern of performance of underachievers so they could come closer to realizing their potential. It is possible to identify two major educational strategies that deal with this problem. The first approach is one of clinical counseling to help the youngsters deal with their self-doubts and anxieties. The second approach is more ecological and involves manipulating the educational environment surrounding these youngsters in ways that help them become more productive. What is missing are comprehensive evaluations of such programs or, at the very least, identification of the critical elements in both the counseling and the environmental approaches that would aid future educators in their attempts to provide some program modification for these puzzling and frustrating youngsters.

Creativity

Creativity is an important dimension, because one assumes that

many of those who are classified as intellectually gifted are the most potentially creative of our citizens. The notion that educators can enhance their talents or creative characteristics has been an attractive one indeed. After two decades, it is time to review what we know about the complex and elusive characteristic we call creativity and to see if we need new and different directions.

There are two distinctly different ways to understand creativity. One is to look at those individuals who have been remarkably successful in creating products of various types. The second is to analyze carefully the process by which anyone can create a new idea or thought. The body of evidence from the study of creative individuals reveals some distinctive personality traits that creative persons from various historical periods and walks of life seem to share. Over a period of years, creative persons have developed a reputation for bizarre or unusual behavior, stemming from their willingness to ignore societal taboos. Creative individuals also usually show an independence in attitude and social behavior. They neither follow nor are swayed by the crowd. They have a strong sense of self and of personal identity, which they can hold to even when it stands in opposition to the group norm. So if one studies the creative individual, one can conclude that the way to enhance creativity is to create those environmental conditions that stimulate these characteristics of independence and openness (Barron, 1969).

The second approach, that of trying to understand the creative process itself, requires some model of intellectual performance, whether it be Bloom's taxonomy of educational objectives or Guilford's structure of intellect or others. One can then observe closely persons in the process of creating and solving unique problems, and identify those characteristics that seem to be most helpful in that process.

The concept of divergent production, or the ability to produce many different and original responses to given situations, has been identified as one such dimension and has received much attention from teachers seeking to find ways to stimulate that particular process or intellectual operation. Many of the educational strategies that have

emerged have attempted to build on divergent production in the hope that stimulating it would stimulate creativity. Recent reviews of the literature, however, have been cautious about the long-range or significant impact of these kinds of programs on children (Mansfield, Busse, and Krepelka, 1978). The areas of research still needed may, in fact, be more insightful biographies of the type done by Gruber (1974) on Charles Darwin. His analysis of the creative processes through a study of Darwin's extensive diaries is a major contribution to the field.

We certainly need more extensive educational evaluation of programs purporting to train creativity that do more than show that the youngsters involved have learned the minor skills that have been taught. We already know that youngsters will learn almost any skill under some form of instruction. What is more to the point is what long-range influence such exercises may have on gifted youngsters.

Content Modification

However fascinating the characteristics of gifted individuals or subgroups of individuals, such as gifted women or creative architects, the essence of the special educational experience must revolve around the adaptation of the educational system to these characteristics. It is in the dimension of how one organizes the curriculum for gifted students that we have found ourselves weakest. Renzulli (1973) has commented on the lack of sophisticated content as follows:

> In conducting evaluative studies, I have witnessed far too many programs for the gifted and they are essentially collections of fun and games activities; such activities lack continuity and showed little evidence of developing in a systematic fashion the mental processes that lead these children to be identified as gifted.

Gallagher (1977) has urged the development of more complex curriculum units and instructional materials for the gifted based upon advanced conceptualization of the subject. That this can be done attractively and effectively has been demonstrated more in the medium of television than in the classroom. The production of Kenneth Clark's Civilisation, or Bronowski's Ascent of Man, or the Nova series clearly indicates how

to present a single central idea of great importance to mankind, and to wrap around it attractive multiple linkages and associations so that the idea becomes understood by the viewer. There is probably no more important task facing special educators today than the valid development of auxiliary curricular materials that will prove to be useful and important tools in the hands of teachers of the gifted.

Attitudes

One of the least studied areas related to gifted education is that of attitudes. Deeply ingrained sets of values and attitudes that relate to mankind and society are brought to bear on the issue of gifted education. These values have roots in our political and religious heritages and are extremely difficult either to trace or to modify.

It is the fate of gifted and talented students to be caught in the swirl of contradictory values currently abroad in American society. One of these values is the importance placed on "equality." This equality value clearly relates to our overcoming an aristocratic elite in the establishment of this nation. Having successfully defeated a government by the elite, we are suspicious of any attempt to reinstitute some version of elitist rule. We are particularly suspicious of the bright and gifted because of their obvious potential for deceiving us and for creating situations where this elite management might come about without our knowledge or our permission. The public school systems are most responsive to this egalitarian value, and those gifted programs that do exist in the elementary and secondary schools are carefully designed to maintain the concept of equality (Weiss, 1978). We do depart from that rather destructive equality in higher education programs, where we create educational environments in which the most talented can use other abilities to the maximum to become lawyers, physicians, or scientists. The problem here is whether we have not lost or turned off a large number of talented students in those elementary and secondary years before they have the opportunity to respond to the more open and stimulating programs of higher education.

Indeed, it seems as though the American public responds favorably to the needs of its gifted members only when the nation is under stress

and we realize that the talented and gifted are a potential national resource or a defense against threats from the outside. The real question is whether we can find some alternative to an external threat that will convince us to act on the overall virtues of supporting quality programs for the gifted. A broad area of potentially fruitful research lies in trying to plumb the logical and emotional linkages that cause so much of the American public to view gifted education with suspicion, if not downright hostility. Until such values are modified, or the linkages between the value and the action are broken, we stand a good chance of not receiving much more public support than the minimal commitment we now possess.

An Effective Support System

The full development of special education programs for a variety of exceptional children--the mentally retarded, the hearing handicapped, the visually handicapped--has depended upon the generation of an effective support system which, when added to the direct service provided by special education personnel, has generated a quality education program. In most communities and states today, one looks in vain for such a support system for the gifted. Gallagher (1979, p. 43) commented upon those elements that comprise an effective support system as follows:

1. Continuous in-service training. It is important that any such programmatic effort involve a continuous and systematic effort to upgrade the skills and knowledge of the teachers directly involved in the program. Workshops and institutes in content areas such as mathematics or social studies, or in stimulating productive thinking, would be examples of such training efforts.
2. Leadership training. It is important that a program of any considerable size have a staff person in a leadership position who has responsibility for systematic program development. Leadership personnel would organize and participate in in-service programs, coordinate content fields, bring in the best of what we know in fields such as mathematics or art from the rest of the educational staff or the community, and provide the administrative leadership for the program within the school system.
3. Research and development. There is a natural assumption that somewhere in some secluded laboratory or research center important research is being done that will

produce new curriculum adventures for the gifted. Unfortunately, this is not true. What is urgently needed, particularly by those resource teachers who are working with the gifted children, is the development of self-contained units that have conceptual validity and that provide the kind of specialized experience and insigl.. to the gifted students that they would not be capable of obtaining through the regular program.

4. Technical assistance and communication. It is important to establish a continuing program of technical assistance that would be available for program consultation to a school system that might wish specialized and individual help on its own program development. Such a unit would help on a variety of needs, such as special curricula and the design and execution of evaluation programs, so that the local school system could assure itself that it is doing a creditable job.

Summary

The field of gifted education has many unresolved issues that will be passed along to the next generation for more adequate resolution. Among the most important are the comprehension of the full implications of giftedness that is created by a mix of genetics and environment and of the broadened definition of giftedness that is still far from operational.

In the special education dimension, there is a particular need for major curricular materials to meet the needs of gifted students and of proven program adaptations for the gifted underachiever and for the culturally different gifted.

Finally, we have yet to come to grips with the ambivalent feelings about giftedness that are abroad in modern American society. These feelings of pride and envy, of security and anxiety, of achievement and competition, shade all of the public actions related to education for the gifted, and we have yet to be able to adapt our own planning and educational programs to that fundamental ambivalence.

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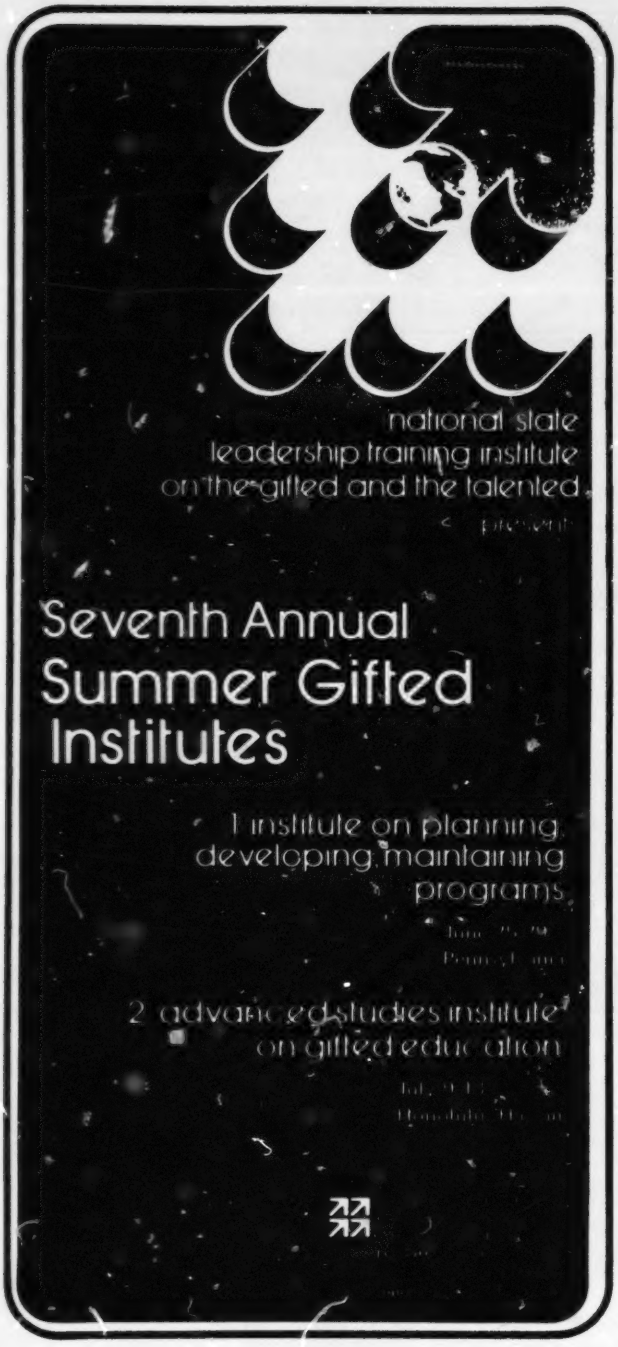
APPENDIX



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Honolulu, Hawaii

FOR:

School administrators, teachers, consultants, university professors, and parents who have had previous N/S-LTI-G/T training and wish to develop expertise in a selected area of gifted education (Enrollment limited to 80; selection to be through application upon the bases of type and length of involvement with gifted/talented, previous training experiences, identified needs and interests)

OBJECTIVES:

1. To identify personal and or agency-related issues in areas such as curriculum, teacher training counseling/guidance, and culturally different gifted/talented, that extend the personal growth of individuals conducting gifted/talented program or enhance the operations of a gifted/talented program
2. To study and discuss intensively and critically these issues
3. To select an issue or sub-issue for individual study and contract to attain a specific personal or institutional goal or need through a study-plan outline
4. To demonstrate clarification or resolution of the selected issue by developing a useful product and/or by making a presentation to peers

The Institute will focus on selected major issues in gifted education. Specially prepared papers on these issues will be written by consultants like Gallagher, Gowan, Passow, and Torrance and opportunities for interaction with them by amplified telephone will be included. Independent readings, small-group discussions, idea-exchange sessions, panel discussions, an Institute library, and individual consultations will further facilitate the exploration of these issues.

AREAS OF STUDY:

I – Theoretical and research issues
II – Curriculum issues
III – Program development issues
IV – Creativity issues

ON-SITE CONSULTANTS *(partial listing):*

Jeanne Delp
Sandra Kaplan
Joseph Renzulli
Irving Sato
Dorothy Sisk
Mary Hunter Wolf

CONSULTANTS BY AMPLIFIED TELEPHONE *(partial listing):*

James Gallagher
John C. Gowan
A. Harry Passow
E. Paul Torrance

REGISTRATION FEE: $275
(After June 22, $300)

APPLICATION REQUEST DEADLINE:
May 7, 1979 (postmark)

(Includes instructional materials)

For Request for Application, see other side of Pre-Registration Form at right. This form must be returned to N/S-LTI-G/T by May 7 (postmark).

N/S-LTI-G/T PUBLICATIONS

Pub. No.

1 **Developing a Written Plan for the Education of Gifted and Talented Students**
Irving S. Sato, Martin Birnbaum, and Jane Early LoCicero

2 **A Guidebook for Evaluating Programs for the Gifted and Talented**
Joseph S. Renzulli

3 **PAB [Parent-Administration-Board Member] Conference Report and Follow-up (Brief Number 1)**
James L. Olivero and Irving S. Sato

4 **Promising Practices: Teaching the Disadvantaged Gifted (Brief Number 2)**
Contributors include Lynn Fox, The Johns Hopkins University; Harry Kitano, UCLA; A. Harry Passow, Teachers College, Columbia University; Lucille Runnels, Quincy (Illinois) High School; Irving S. Sato, N/S-LTI-G/T; E. Paul Torrance, University of Georgia

5 **Providing Programs for the Gifted and Talented**
Sandra Kaplan

6 **A Handbook for Parents of Gifted and Talented**
Jeanne L. Delp and Ruth A. Martinson

7 **The First National Conference on the Disadvantaged Gifted**
Presentations from the March 1973 Disadvantaged Gifted Conference, Ventura, California

8 **The Identification of the Gifted and Talented**
Ruth A. Martinson

9 **Parentspeak on Gifted and Talented Children**
Kay Coffey, Gina Ginsberg, Carrol Lockhart, DeLois McCartney, Carol Nathan, and Keith Wood

10 **New Directions for Gifted Education (Brief Number 3)**
Presentations from the Bicentennial Midyear Leadership Training Institute at Kansas City, January 1976.

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N/S-LTI-G/T PUBLICATIONS

(Continued from Inside of Back Cover)

Pub. No.

11 **A Guide Toward Better Teaching for the Gifted**
Ruth A. Martinson

12 **Self-Directed Study Guide on the Education of the Gifted and the Talented**
Donald J. Treffinger and Clifford D. Curl

13 **Everyday Enrichment for Gifted Children at Home and School**
Herbert Kanigher

14 **A New Generation of Leadership Education for the Gifted in Leadership**
Paul Barton, Joelcira Cavedon, Paul Judkins, James Olivero, Sidney Parnes, Mary Ruiz, and Donald Treloar

15 **Advantage: Disadvantaged Gifted**
Harry N. Rivlin, Maija S. Blaubergs, Ed Dodson, Bruce Mitchell, Lynn H. Fox, Mary M. Frasier, Severo Gomez, Moshe Smilansky, David Nevo, and Soon-Teck Oh

16 **Ideas for Urban/Rural Gifted/Talented: Case Histories and Program Plans**
Martin Birnbaum, Jean M. Blanning, Gilbert Caudill, and Paul Plowman

17 **Gifts, Talents, and the Very Young**
Presentations from the Institute on Gifted/Talented Early Childhood Education, January 1977, Oxnard, California

18 **What Is Giftedness?**
Joseph S. Renzulli

19 **Issues in Gifted Education (Brief Number 6)**
James J. Gallagher, John Curtis Gowan, A. Harry Passow, and E. Paul Torrance

20 **Developing IEPs for the Gifted/Talented (working draft)**
Sherri M. Butterfield, Sandra N. Kaplan, Mary Meeker, Joseph S. Renzulli, Linda H. Smith, and Donald J. Treffinger